APPENDIX A

City of Banning, Draft 2010 Urban Water Management Plan

City of Banning Draft 2010
Urban Water Management Plan

PREPARED FOR:

City of Banning

May 11, 2011

GEOSCIENCE

PREPARED BY:

GEOSCIENCE Support Services, Inc., **Ground Water Resources Development**

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GEOSCIENCE

May 11, 2011

Mr. Duane Burk
Public Works Director
City of Banning
Post Office Box 998
Banning, CA 9222

Subject: City of Banning DRAFT 2010 Urban Water Management Plan (UWMP)

Dear Mr. Burk:

Attached to this letter are 20 copies on compact disc of the City of Banning, DRAFT 2010 Urban Water Management Plan. It is our understanding that the draft plan will be made available for public review from May 16, 2011 through June 14, 2011. We further understand that the draft plan will be discussed in a public forum on June 14, 2011 and submitted to the City Council on June 28, 2011 for adoption. Following adoption, the draft plan should be submitted to the California Department of Water Resources within 30 days of approval, made available to the public again within 60 days, and submitted to the County of Riverside and State Library within 60 days of approval.

The City of Banning 2011 UWMP was prepared following guidelines released by the California Department of Water Resources (DWR) March 2011. Based on the new guidelines, the 2010 UWMP was reformatted and amended to follow recommendations and requirements provided in the 2010 UWMP guidance document prepared by DWR.

As you are aware, the passage of Senate Bills (SB) 221 and 610 in 2001, have made the Urban Water Management Plan the foundational document for demonstrating sufficient water supplies for future development. Both SB 221 and 610 require verification of water supplies that are based in part on proof of valid water rights, regulatory approvals required to convey or deliver sufficient water supply, and an adopted capital outlay program for financing the delivery of sufficient water supply. The 2011 UWMP considers information provided by pertinent plans and actions adopted by the City after the preparation of the 2005 UWMP.

In order to satisfy the requirements of SB 221 and 610, the City since 2005, has implemented many of the items recommended in the 2005 UWMP including:

- Application for State Water Project (SWP) water service from San Gorgonio Pass Water Agency
- Application and Approval from the Beaumont Basin Watermaster for Additional Storage Capacity in the Beaumont Basin
- Initiation of the process to upgrade the City of Banning Wastewater Treatment Plant to provide recycled water for irrigation.

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For future water supply augmentation and sustainability, GEOSCIENCE recommends that the City of Banning implement the following:

- Development of projects for capture and recharge of stormwater run-off from mountain front watersheds as well as capture of urban run-off.

- Development of additional well capacity in the Cabazon Storage Unit to allow capture and utilization of water percolated by the City in the Cabazon Storage Unit

- Continued and expanded implementation of the Demand Management Measures outlined in Section 6.0 of the 2011 UWMP.

- Prepare for future development of additional capacity to generate recycled water beyond the Phase I Wastewater Treatment Plant expansion to maximize the treatment of wastewater to meet the City's growing recycled water demand

Please contact us if you have any questions and thank you for opportunity to provide our services to prepare this important document.

Sincerely,

Dennis E. Williams, Ph.D., P.G., C.Hg.
President
GEOSCIENCE Support Services, Inc.

CITY OF BANNING DRAFT 2010 URBAN WATER MANAGEMENT PLAN

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APPENDICES

List of Acronyms

20x2020	Water use reduction per capita by 20% by the year 2020
acre-ft/yr	Acre feet per year
AMR	Automatic Meter Read
BCVWD	Beaumont Cherry Valley Water District
BMP	Best management practices
BMZ	Beaumont Management Zone
BOD	biological oxygen demand
CAA	General Conformity Rule for the Clean Air Act
CDFM	cumulative departure from the mean
CDHS	State of California Department of Health Services
CDOF	California State Department of Finance
CEQA	California Environmental Quality Act
cfs	cubic feet per second
CII	Commercial, Industrial and Institutional
CIMIS	California Irrigation Management Information System
COOP	Cooperative Observer Program
CUWA	California Urban Water Agencies
CUWCC	California Urban Water Conservation Council
CWC	California Water Code
DIR	Demand-initiated regenerating
DWR	California Department of Water Resources
EDU's	equivalent dwelling units
EIR	Environmental Impact Report
ESA	Endangered Species Act
Et_o	evapotranspiration
gpcd	Gallons per capita per day
gpm	gallons per minute
HAP	Housing Assistants Payment
HEWs	high-efficiency clothes washing machines
MBR	Membrane Bioreactor
MCL	maximum contaminant level
MG	Million gallons
mg/L	milligrams per liter
mgd	Million gallons per day
MND	Mitigated Negative Declaration
MOU	Memorandum of Understanding
NHPA	National Historic Preservation Act
PHA	the Public Housing Authority
RCFCD	Riverside County Flood Control District
RCFCWCD	Riverside County Flood Control and Water Conservation District
RHNA	Regional Housing Needs Assessment

List of Acronyms (continued)

RWQCB	Santa Ana Regional Water Quality Control Board
SBx7-7	Senate Bill x7-7
SGPWA	San Gorgonio Pass Water Agency
SIR	Special Investigations Report
SMWD	South Mesa Water District
SOI	City of Banning Sphere of Influence
SRF	State Revolving Fund
SWP	State Water Project
TDS	Total Dissolved Solids
The City	City of Banning
ug/L	micrograms per liter
ULFT	Ultra Low Flush Toilet
USEPA	U.S. Environmental Protection Agency
USGS	United States Geological Survey
UWMP	Urban Water Management Plan
UWMPA	Urban Water Management Planning Act
VOCs	volatile organic compounds
WSCP	Water Shortage Contingency Plan
WWTP	Wastewater Treatment Plant
YVWD	Yucaipa Valley Water District

1.0 PLAN PREPARATION

1.1 Urban Water Management Planning Act

All urban water suppliers within the State of California are required to prepare urban water management plans. California Water Code Sections 10610 through 10657 detail the information that must be included in these plans as well as who must file them. Each of the following sections of the plan are preceded by the applicable water code.

According to the Act, an urban water supplier is defined as a supplier, publicly or privately owned, that either provides over 3,000 acre-feet of water annually for municipal purposes or serves more than 3,000 or more connections. The urban water supplier is required to assess the reliability of its water sources over a 20-year planning horizon considering normal, dry, and multiple-dry years. An optional additional 5 year period (2035) can be added to the analysis to allow use of the water supply and demand estimates through the completion of the 2015 UWMP. This assessment shall be incorporated into the UWMP which support their long-term resource planning and ensure adequate water supplies are available to meet existing and future water demands. The plan shall be adopted by the urban water supplier and submitted to the California Department of Water Resources (DWR) and updated every five years.

Amendments to the UWMPA since the 2005 UWMP report were submitted include the passing of California Governor Schwarzenegger's 20x2020 Plan, ultimately referred to as the Water Conservation Act of 2009. In an effort to ensure sufficient statewide water supply in support of a growing population, state legislation was passed to reduce per capita water use by 20% by December 31, 2020. In order to achieve the Water Conservation Act of 2009, an incremental goal of 10% per capita reduction in water use by December 31, 2015 has been established. As part of the Water Conservation Act of 2009 the deadline of 2010 UWMP was extended to July 1, 2011.

This plan satisfies the requirements of the Urban Water Management Planning Act (UWMPA) of 1983 and the subsequent amendments to the Act. The text of the Act including the Water Conservation Senate Bill No. 7 can be found in Appendix A. This report constitutes the 2010 update to the City of Banning's 2005 Urban Water Management Plan (UWMP) prepared by Wildermuth Environmental Inc.

1.2 Coordination

Law: 10620: *(d)(2) Each urban water supplier shall coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.*

Law: 10621: *(b) Every urban water supplier is required to prepare a plan pursuant to this part shall, at least 60 days prior to the public hearing on the plan required by Section 10642, notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan.. the urban water supplier may consult with, and obtain comments from, any city or county that receives notice pursuant to this subdivision.*

Law: 10635: *(b) The urban water supplier shall provide that portion of its urban water management plan prepared pursuant to this article to any city or county within which it provides water supplies no later than 60 days after the submission of its urban water management plan.*

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

Law: 10621: *(c) The amendments to, or changes in, the plan shall be adopted and filed in the manner set forth in article 3 (commencing with Section 10640).*

Law: 10642: *After the hearing, the plan shall be adopted as prepared or as modified after the hearing.*

Law: 10643:	*An urban water supplier shall implement its plan adopted pursuant to this chapter in accordance with the schedule set forth in its plan.*
Law: 10644:	*(a) An urban water supplier shall submit to the department, the California State Library, and any city or county within which the supplier provides water supplies a copy of its plan no later than 30 days after adoption. Copies of amendments or changes to the plans shall be submitted to the department, the California State Library, and any city or county within which the supplier provides water supplies within 30 days after adoption.*
Law: 10645:	*Not later than 30 days after filing a copy of its plan with the department, the urban water supplier and the department shall make the plan available for public review during normal business hours.*

1.2.1 Agency Involvement

Table 1-1 summarizes the actions the City has taken to involve various agencies and the community in the planning process of the UWMP.

Table 1-1
Coordination and Public Involvement

[To be completed after review period]

	Participated in Developing the plan	Commented on the Draft	Attended Public Meeting	Was contacted for assistance	Was Sent a Copy of the Draft Plan	Was Sent a Notice of Intention to Adopt	Not Involved / No Information
SGPWA							
BCVWD							
Beaumont Basin Watermaster							
YVWD							
High Valley Water District							
City of Beaumont							
County of Riverside							
General Public							
Various Developers							

Notices announcing the availability of the UWMP update and Public Hearing were announced in the local newspaper starting in the month of April, 2011. The citizens of the City of Banning were encouraged to offer their comments on the Draft 2010 UWMP made available for public review May 16, 2011.

1.2.2 Public Hearing

A informal presentation of the 2010 UWMP was held on June 14, 2011 followed by a public hearing to present the UWMP and discuss the Water Conservation Act of 2009 held in City Council Chambers, 99 E. Ramsey Street, Banning, on June 28, 2011. A notice of the hearing was submitted 60 days prior to the date of the hearing. Modifications generated through the hearing process will be included prior to the adoption process. Documentation of notice of the public hearing and a summary of the public hearing, including requested modifications, is provided in Appendix B.

1.2.3 Availability of Draft and Final UWMP

A list of agencies and public entities which received a copy of the Draft 2010 UWMP and documentation submittal is provided in Appendix B. A copy of the draft UWMP was also made available to the public on the City's website, as well as a hard copy was made available at the City Library and at the Public Works counter. Comments on the Draft UWMP can also be found in Appendix B.

A copy of the 2010 UWMP will be available for public review no later than 60 days after the July 1st, 2011 submission deadline on the City's website and at the Public Works counter. Documentation of these submittals will be provided to DWR as required.

This 2010 UWMP was prepared by:

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1.3 Plan Adoption, Submittal and Implementation

The UWMP checklist was completed to ensure completeness prior to submittal to the DWR and is included in Section 7. A copy of the adoption of the 2010 UWMP is provided in Appendix C.

1.3.1 Adopting resolution

This UWMP will be implemented by [place holder].

This updated plan is proposed to be adopted by the City Council on June 28th, 2011, and will be submitted to the California Department of Water Resources and the California State Library and the County of Riverside within 30 days of approval for public review. This plan includes all information necessary to meet the requirements of California Water Code Division 6, Part 2.6 Urban Water Management Planning. Document transmittal forms verifying submittal of the UWMP to DWR and the California State Library within 30 days of approval is attached as Appendix D.

1.3.2 Cooperative Agreements with Local Agencies

- The City of Banning along with the Yucaipa Valley Water District (YVWD), City of Beaumont, Beaumont Cherry Valley Water District (BCVWD) and South Mesa Water District (SMWD) jointly act as Watermaster for the Beaumont Storage Unit under the court Judgment of 2004.
- The City of Banning, jointly owns and operates three wells in the Beaumont Storage Unit with BCVWD for conjunctive use from recharge with the BCVWD.
- The City of Banning is in a Joint Agreement between Banning Heights Water Company and Southern California Edison for the restoration of the Flume.
- The City of Banning is participating with YVWD, BCVWD and the City of Beaumont in the Beaumont Management Zone (BMZ) Maximum Benefits Program. The Maximum Benefits Program is under the oversight of the Santa Ana Regional Water Quality Control Board and will ensure the long-term sustainability of water quality in the BMZ.
- Additional agency involvement includes the discussion of the joint development of an Integrated Regional Water Management Plan for the Banning ground water resource area along with YVWD and BCVWD. Currently the City does not have a groundwater management plan.

2.0 SYSTEM DESCRIPTION

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

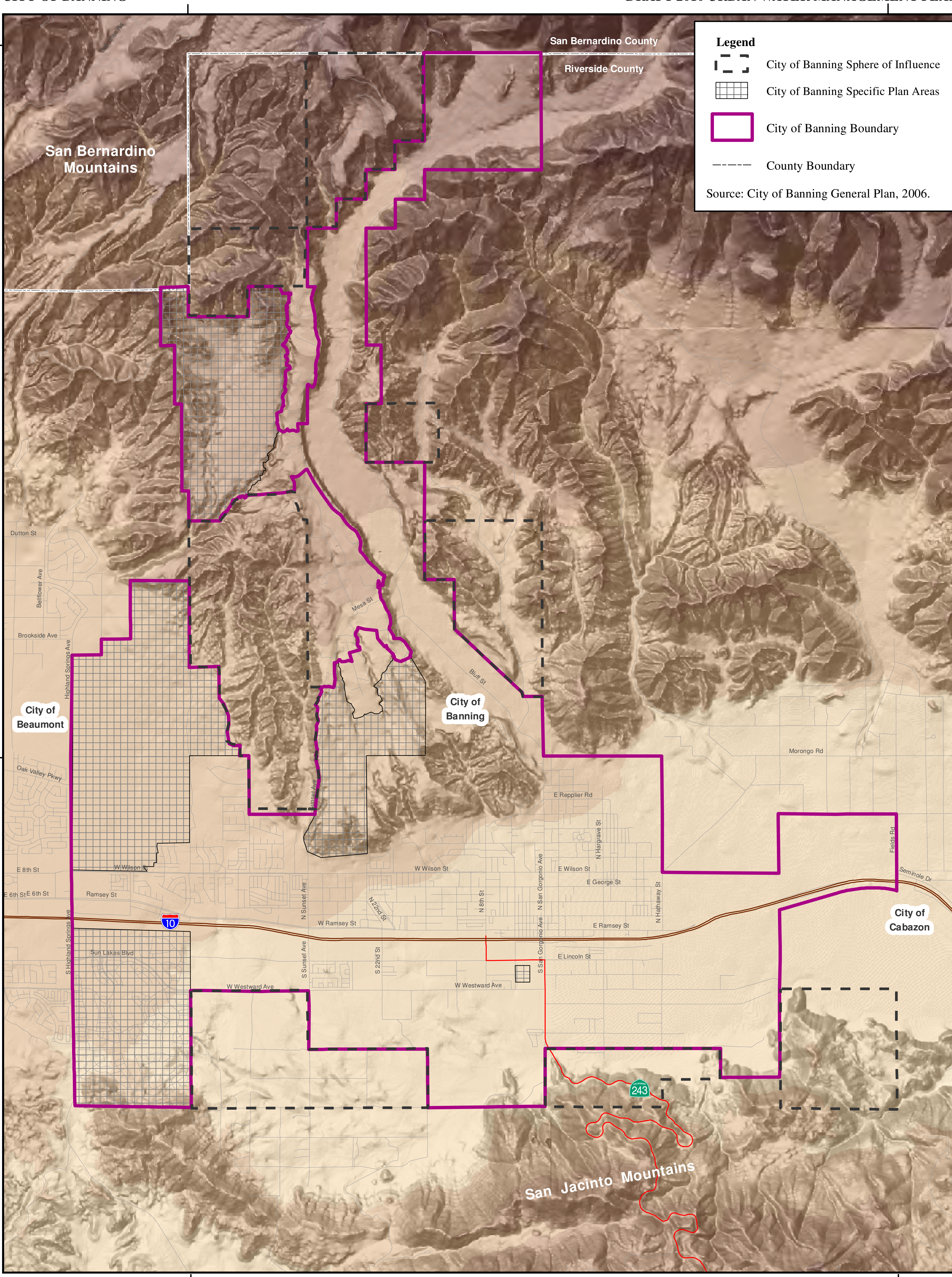
(a) Describe the service area of the supplier, including current and projected population, climate, and other demographic facts affecting the supplier's water management planning. The projected population estimates shall be based upon data from the state, regional, or local service agency population projections within the service area of the urban water supplier and shall be in five-year increments to 20 years or as far as data is available.

2.1 Service Area Physical Description

The City of Banning, shown in Figure 2-1, covers approximately 23.2 square miles located in the San Gorgonio Pass area of Riverside County, approximately 30 miles east of the cities of San Bernardino and Riverside. It is bound to the West by the cities of Beaumont and Cherry Valley and to the east approximately 1.6 miles is the city of Cabazon. The western most part of the City of Banning's planning area is at the summit of the San Gorgonio Pass, which divides two major watersheds: the Santa Ana River Watershed to the west and the Salton Sea Watershed to the east. This divide also forms the basis for the boundary between the Regional Water Quality Control Board designated South Coastal Hydrologic Area on the west from the Colorado River Hydrologic Area on the east. The majority of the City drains east into the Salton Sea Watershed. Elevations within the planning area rise to approximately 5,560 feet to the north and 2,880 feet to the south. The San Gorgonio River flows from above the northern most boundary of the City of Banning forming Banning Canyon.

The first recorded claims to the waters of Banning Canyon date back to 1875. The Banning Water Company was incorporated in 1884 to provide the delivery of domestic and irrigation water to various customers of the City of Banning. In 1913 the Banning Water Company entered into an agreement with the Consolidated Reservoir and Power Company for the delivery of 13.26 cfs of water from the headwaters of the Whitewater River. The Banning Heights Mutual Water Company and the City of

T.1 S.
T.2 S.



T.2 S.
T.3 S.

R.1 W. R.1 E. R.1 E. R.2 E.

CITY OF BANNING SERVICE AREA

NORTH
0 0.5 1 Miles

10-May-11

Prepared by: DWB. Map Projection: UTM 1927, Zone 11.

DRAFT

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Figure 2-1

GIS_proj/city_of_banning_2010_UWMP_4-11/0_Fig_2-1_portrait_service_area_5-11.mxd

Banning now receive a portion of that water. In that same year, the Banning Water Company began to operate as a public utility under the rules of the Railroad Commission (now the Public Utilities Commission). In 1957, an order was issued establishing rates for both general metered services and measured irrigation services. The City of Banning acquired the Banning Water Company in 1967. In 1997, the City purchased the Mountain Water Company. The Mountain Water Company supplied water to its customers from groundwater wells located in the City and in the unincorporated portion of the County of Riverside.

The City of Banning Public Works and Utilities Department currently provides domestic water services to all areas of the City except for a small section in the northern portion of the City, which is serviced by the Banning Heights Mutual Water Company. The City owns and operates wells, reservoirs, and a distribution line system to deliver domestic water within the Banning planning area. The City provides municipal water service to an area of approximately 23.2 square miles, including approximately 29,603 people (2010 Census), via 11,006 metered connections (DWR Public Water System Statistics, 2010).

The legal boundary of the City encompasses an area of 14,823 acres. An additional 5,436 acres are within the City's Sphere of Influence (SOI), and 3,296 acres are within the planning area. Figure 2-1 shows the City's boundary, SOI, and planning area.

2.1.1 Climate Characteristics

The Banning area is generally characterized by a typical Mediterranean climate of hot, dry summers and short, mild, moist winters. Air temperature in the City of Banning area follows a pattern of high summer and low winter temperatures. Winter temperatures are lower than those recorded in the lower basin areas of Southern California as the City of Banning is further inland and lacks the buffering effect from the Pacific Ocean. Table 2-1 summarizes climatic characteristics for the City of Banning. Temperature values are monthly averages for 1948 to 2001 measured at Riverside County Flood Control District

(RCFCD) Beaumont Station 1E (Beaumont Station 1E discontinued operation in 2001, however is used in this analysis as the most representative data available due to distance of other stations with evaporation data from the study area). Average winter temperatures range from high daily temperatures of 60 to 69 degrees Fahrenheit to lows between 39 and 43 degrees Fahrenheit (see Table 2-1). The summer maximum average temperatures range from 88 to 96 degrees Fahrenheit with the lows from 53 to 59 degrees Fahrenheit.

The evapotranspiration (ETo) values obtained from Beaumont Station 1E had a limited period of record available (1948-1957), a period of record which more accurately represents wet and dry cycles was used in this analysis. Monthly averages for 1985-2009 as measured at California Irrigation Management Information System (CIMIS) Station 44 at U.C. Riverside in Riverside, California located approximately 35 miles from Banning. The next closest CIMIS station to the City of Banning is located in Winchester and has comparable ETo values. ETo ranges from a high of 7.37 inches in the month of July to a low of 2.44 inches in December.

Table 2-1 Monthly Precipitation and Evaporation Summaries

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Maximum Average Monthly Temperature (F)	60.5	63.6	66.2	72.4	78.7	88.1	95.6	95.5	90.4	80.6	69.3	62.0
Minimum Average Monthly Temperature (F)	38.6	39.1	40.0	42.7	47.6	52.6	58.4	58.9	55.8	49.3	43.0	39.2
Average Monthly Precipitation (in)	3.76	3.44	3.12	1.36	0.63	0.15	0.23	0.21	0.51	0.59	1.65	2.09
Average Maximum Monthly Precipitation (in)	20.4	13.2	11.40	6.53	4.14	1.98	3.06	2.49	4.6	4.6	9.02	10.90
Average Minimum Monthly Precipitation (in)	0	0	0	0	0	0	0	0	0	0	0	0
Average Monthly Evaporation (in)	2.61	2.89	4.33	5.33	6.16	6.73	7.37	7.05	5.43	4.02	2.97	2.44

Source: EarthInfo, 2009, CIMIS, 2010.
Temperature and precipitation averaged during 1948 to 2001 (EarthInfo, 2009).
Evaporation averaged from 1985 to 2009 (CIMIS, 2010).

Three representative weather stations in and around the Banning water resource area were used to determine long term annual precipitation. The data were measured at Riverside County Flood Control and Water Conservation District (RCFCWCD) Weather Stations 011, 013 and 025 in the Banning area. Table 2-2 summarizes the annual precipitation data for the three representative stations. Long-term annual precipitation was based on the Beaumont station rain gauge from 1888 through 2009. Annual precipitation ranges from a minimum of 6.4 inches (1999) to a maximum of 36.37 inches (1978). The average annual precipitation is 17.77 inches per year. The average annual precipitation at the Banning Bench gauge is 22.31 inches per year. The average annual precipitation at the Cabazon gauge is 12.49 inches per year. Precipitation in the western portion of the San Gorgonio Pass is slightly higher than in the eastern portion. This precipitation distribution pattern is due to the rain-shadow effect of the mountains on storms migrating inland from the Pacific Ocean.

Annual precipitation is presented graphically in Figures 2-2, 2-3 and 2-4 along with the cumulative departure from the mean (CDFM). These graphs show how cumulative precipitation has varied from the long-term average calculated for each precipitation station. A downward (negative) slope in the cumulative departure from mean precipitation line indicates a dry cycle whereas an upward (positive) slope in this line indicates a wet cycle. The City of Banning has been experiencing a dry period since 2005 as shown by the sharp negative slope of the CDFM curve.

Table 2-2
Annual Precipitation

Year	Annual Precipitation Beaumont Station No. 13 [inches]	Banning Bench Station No. 11 [inches]	Cabazon Station No. 25 [inches]	Year	Annual Precipitation Beaumont Station No. 13 [inches]	Banning Bench Station No. 11 [inches]	Cabazon Station No. 25 [inches]
1888	18.53	-	-	**1923**	13.74	-	-
1889	22.50	-	-	**1924**	14.04	-	-
1890	16.29	-	-	**1925**	13.15	-	-
1891	18.93	-	-	**1926**	26.92	-	-
1892	13.51	-	-	**1927**	26.02	-	-
1893	21.67	-	-	**1928**	12.83	-	-
1894	12.80	-	-	**1929**	11.19	-	-
1895	19.88	-	-	**1930**	22.49	-	-
1896	9.48	-	-	**1931**	21.69	-	-
1897	15.94	-	-	**1932**	20.01	-	-
1898	7.48	-	-	**1933**	15.59	-	-
1899	10.54	-	-	**1934**	14.55	-	-
1900	11.27	-	-	**1935**	15.47	-	-
1901	13.85	-	-	**1936**	25.25	-	-
1902	15.40	-	-	**1937**	24.23	-	-
1903	20.82	-	-	**1938**	26.84	-	-
1904	12.78	-	-	**1939**	18.65	-	-
1905	31.79	-	-	**1940**	23.77	-	-
1906	18.96	-	-	**1941**	29.96	-	-
1907	22.24	-	-	**1942**	10.94	-	-
1908	17.18	-	-	**1943**	27.33	-	-
1909	27.93	-	-	**1944**	19.53	-	-
1910	9.49	-	-	**1945**	20.20	-	-
1911	20.41	-	-	**1946**	21.40	-	-
1912	16.83	-	-	**1947**	7.96	-	-
1913	14.83	-	-	**1948**	10.91	-	-
1914	25.33	-	-	**1949**	13.76		
1915	28.80	-	-	**1950**	11.50		
1916	27.89	-	-	**1951**	16.71		
1917	13.81	-	-	**1952**	23.03		
1918	22.72	-	-	**1953**	7.86		
1919	14.86	-	-	**1954**	20.28		
1920	21.66	-	-	**1955**	13.30		
1921	30.63	-	-	**1956**	9.89		
1922	23.18	-	-	**1957**	21.14		

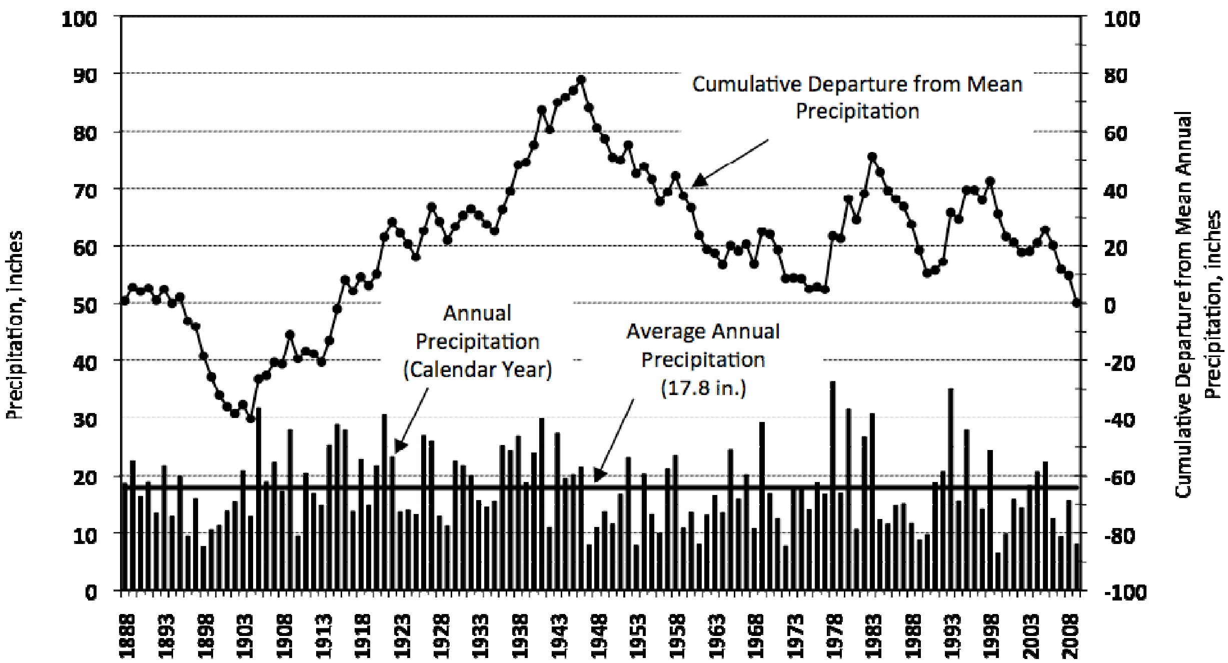
Source: Riverside County Flood Control and Water Conservation District

Table 2-2
Annual Precipitation
(continued)

Year	Annual Precipitation			Year	Annual Precipitation		
	Beaumont Station No. 13 [inches]	Banning Bench Station No. 11 [inches]	Cabazon Station No. 25 [inches]		Beaumont Station No. 13 [inches]	Banning Bench Station No. 11 [inches]	Cabazon Station No. 25 [inches]
1958	23.38			**1984**	12.17	12.21	7.46
1959	10.84			**1985**	11.50	16.38	8.73
1960	13.65			**1986**	14.80	20.85	11.41
1961	8.08			**1987**	15.10	16.44	11.48
1962	13.00			**1988**	11.60	16.70	7.77
1963	16.47			**1989**	8.80	12.07	4.74
1964	13.59			**1990**	9.70	15.27	6.93
1965	24.54			**1991**	18.80	17.50	19.4
1966	15.88			**1992**	20.70	25.94	14.53
1967	20.17			**1993**	34.98	39.92	26.07
1968	10.71			**1994**	15.50	17.75	10.09
1969	29.13			**1995**	27.90	34.41	20.47
1970	16.82			**1996**	17.80	24.38	10.53
1971	12.42			**1997**	14.20	20.62	8.02
1972	7.77	-	-	**1998**	24.32	28.41	17.83
1973	17.97	-	-	**1999**	6.40	13.33	6.14
1974	17.50	21.50	-	**2000**	9.78	16.72	8.53
1975	14.10	18.14	-	**2001**	15.80	16.31	8.37
1976	18.70	29.28	14.19	**2002**	14.40	8.80	3.39
1977	16.69	28.19	11.98	**2003**	18.10	18.79	11.83
1978	36.37	47.56	27.44	**2004**	20.68	20.89	13.58
1979	16.90	23.30	15.1	**2005**	22.26	24.77	13.33
1980	31.61	43.19	24.15	**2006**	12.40	15.03	6.9
1981	10.60	11.80	9.49	**2007**	9.40	11.66	5.02
1982	26.70	36.97	19.26	**2008**	15.62	20.55	10.34
1983	30.80	46.33	24.13	**2009**	8.13	11.27	5.98

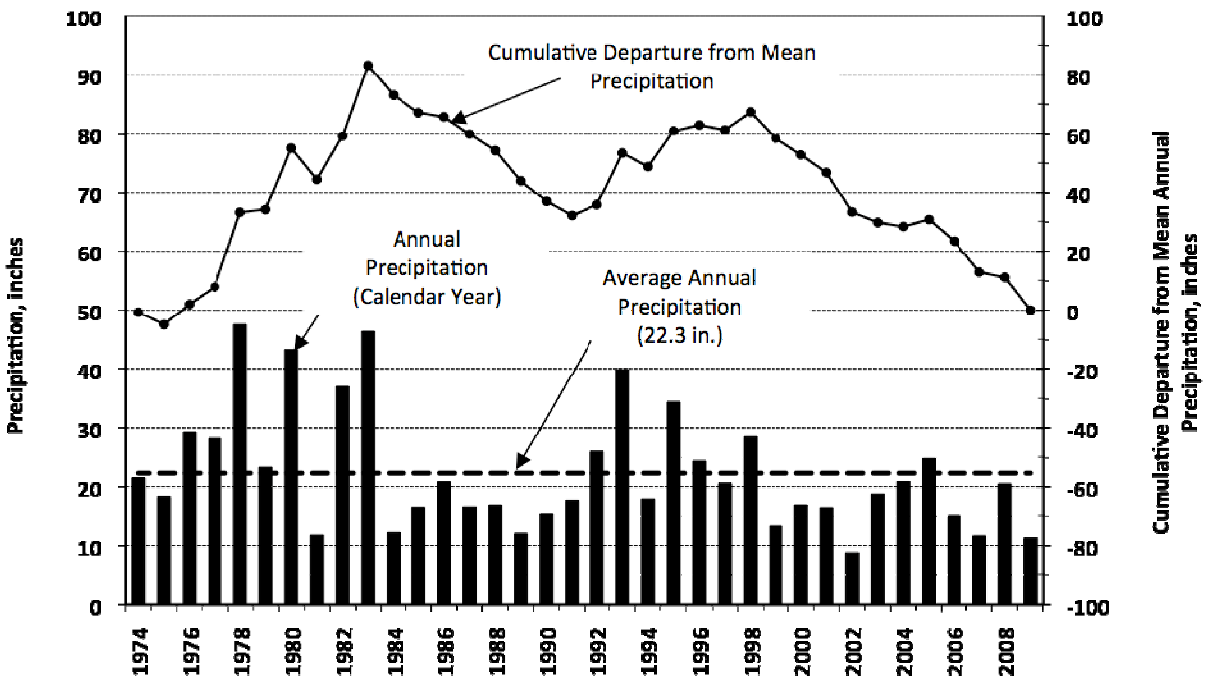
Source: Riverside County Flood Control and Water Conservation District

Figure 2-2
Annual Precipitation and Cumulative Departure from Mean Annual Precipitation
Beaumont Weather Station 013
(1888 to 2009)



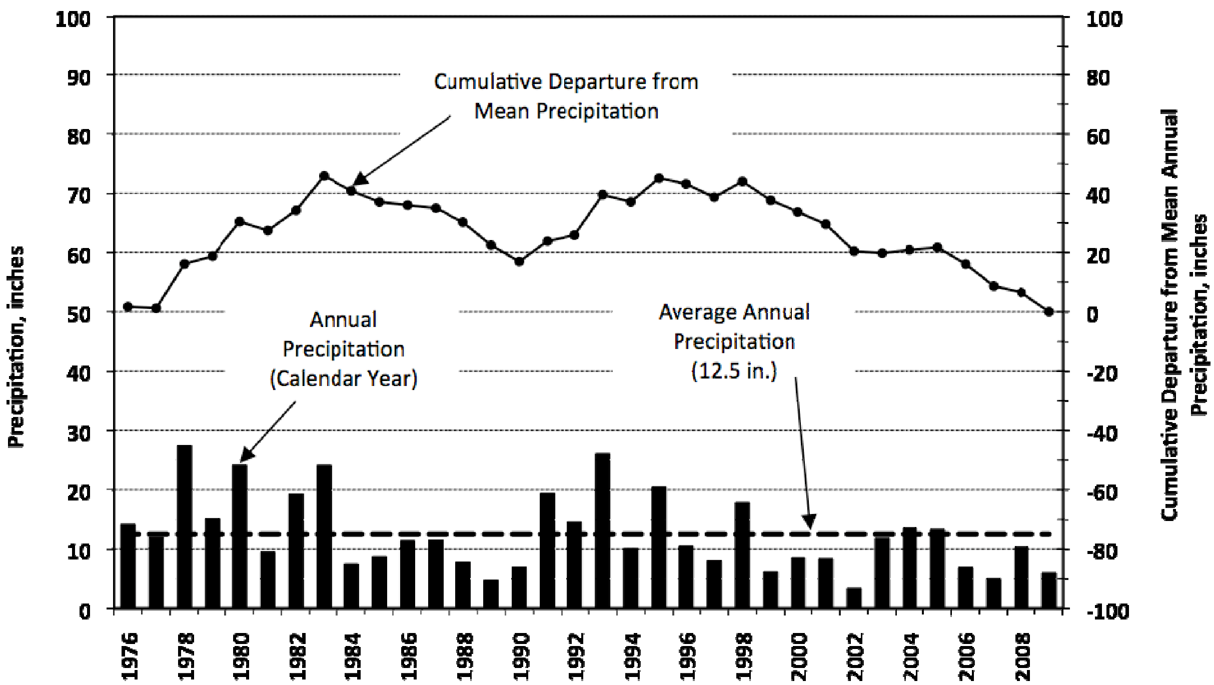
Source: Riverside County Flood Control and Water Conservation District (2010).
Note: Data are presented in calendar years (January 1 to December 31).

Figure 2-3
Annual Precipitation and Cumulative Departure from Mean Annual Precipitation
Banning Bench Weather Station 011
(1974 to 2009)



Source: Riverside County Flood Control anc Water Conservation District (2010).
Note: Data are presented in calendar years (January 1 to December 31).

Figure 2-4
Annual Precipitation and Cumulative Departure from Mean Annual Precipitation
Cabazon Weather Station 025
(1976 to 2009)



Source: Riverside County Flood Control and Water Conservation District (2010).
Note: Data are presented in calendar years (January 1 to December 31).

2.1.2 Demographic Characteristics

2.1.2.1 Population Density

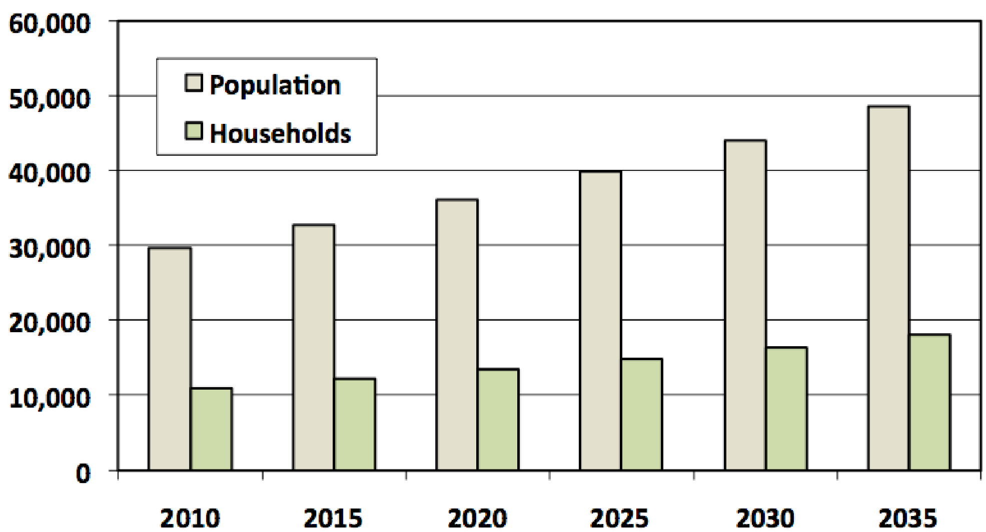
Table 2-3 and Figure 2-5 shows the current population and occupied housing estimates based on data from forecasted population estimates based on the City of Banning 2008 Draft Housing Element Update for years 2008-2014, California State Department of Finance (CODF) estimates for 2008 and 2009, and Census data for 1990, 2000 and 2010. Over the next 25 years, the population of the City of Banning is estimated to grow by approximately 19,000 people at an average growth of 760 people per year, or an approximate growth rate of 2% per year. The 2008 Draft Housing Element Update also estimated that there are approximately 2.7 people per equivalent dwelling units (EDUs) and that this will continue into the future. The projected household estimates for 2015 through 2035 shown on Table 2-3 is based on this factor of 2.7 people per dwelling unit and the projected population increase.

Table 2-3
Population, EDU and Household Projections

	2010[1]	2015	2020	2025	2030	2035
Population	29,603	32,684	36,086	39,842	43,989	48,567
People/EDU	2.7	2.7	2.7	2.7	2.7	2.7
Households	10,838	12,105	13,365	14,756	16,292	17,988

[1]Data from CDOF 2010 Census

Figure 2-5
Population and Household Growth Projections



2.1.2.2 Land Development

The City of Banning's future landuse primarily consists of two types of developments: master planned communities and the continuation of infill development. Existing and proposed master planned communities, including the Sun Lakes project, the Loma Linda Specific Plan, the Butterfield Specific Plan, and the Sunset Crossroads Specific Plan, include specific landuse designations (i.e. commercial, public facilities, open space, etc.) and have been incorporated into the City's landuse designations at buildout per the City of Banning's 2006 General plan. Table 2-4 lists the City's development projects and associated equivalent dwelling units (EDUs). The projects listed in the later part of Table 2-4 are shown as planned acreage or planned square footage. The time frame for completion of these development projects is difficult to estimate as final completion varies based on future economic conditions. Therefore, the increase in population and related building developments is assumed to occur at a rate estimated from the most recent population trends discussed in the Section 2.1.2.1.

Table 2-4
City of Banning Development Projects

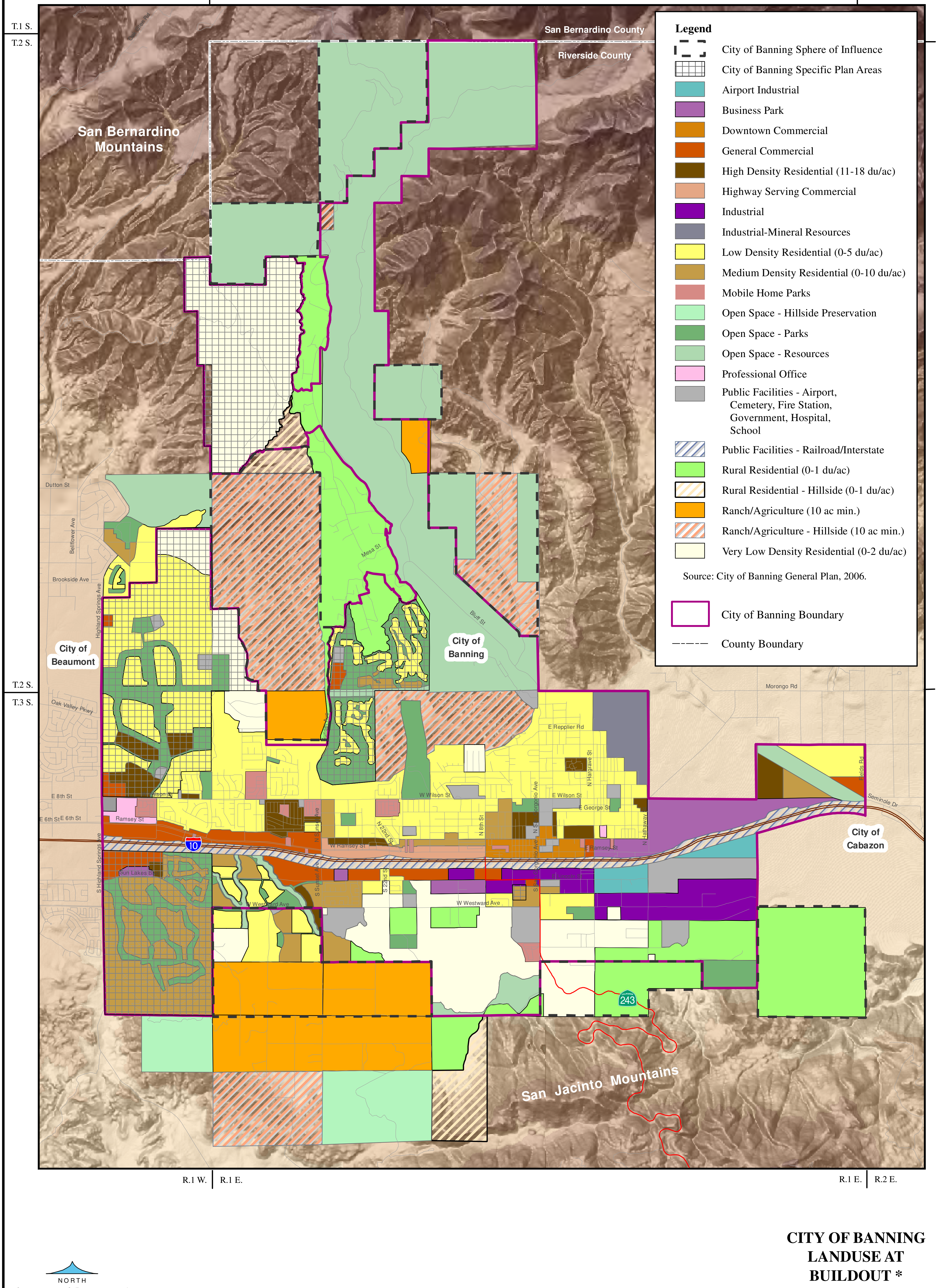
Project	Tentative Tract Map Number	Status	Number of EDUs
Barbour Villas	35694	Approved	36
Loma Linda Specific Plan		Approved SP, Dev Agreement & EIR	944
Butterfield Specific Plan		Approved SP, Dev Agreement & EIR	5,400
Charter Management/ Galleher	30528	Approved	9
C.W. Tefft	31924	Approved	478
Fiesta Development	30906	Approved	303
Madrid	32429	Approved	44
Martin	33013	Approved	6
Nordquist	32370	Approved	19
Rifai	33798	Approved	19
Rochelle & Oberg	29233	Approved	10
St. Boniface/Gilman	33540	Approved	172
Tahiti Group	31614	Approved	30
TMS Homes	35363	Approved	23
VicSeth Construction	32175	Approved	10
VicSeth Construction	31417	Approved	21
HLCD	32217	Approved	26
Silverstone	33326	Approved	14
Linc Busin Park	33401	Approved	21
Leyva	33515	Approved	2
Gordon	34335	Approved	8
Oman/BBC	34736	Approved	104
Kohavi	35300	Approved	4
Total			**7,703**

Note: The table above provides a list of approved tentative tract maps and the associated numbers of lots. Project name may change due to sale of property or other economic actions.

Table 2-4
City of Banning Development Projects (continued)

Project	Status	Sq ft/Acres/Rooms
Careage Development	Complete	17 Rooms; 32 Beds
Inland Behavioral & Health Mental & Dental Clinic	Approved	9,000 sq ft (1.16 acres)
O'Donnel Industrial Park	Under Construction	1.2 Million sq ft (27.5 acres)
San Gorgonio Memorial Hospital	Under Construction	24.24 (acres)

Table 2-5 shows the most recent landuse summaries within the City Limits, Sphere of Influence and Planning Areas (assumed to be 2006, as this is when the General Plan was adopted) and the landuse at buildout (City of Banning General Plan, 2006). The greatest increases in acreage per landuse are in the ranch/agricultural, rural residential, hillside preservation and open space resources categories. The City of Banning is committed to preserving its hillsides. Within these categories are hillside designations, which allow for the development of flat areas at a greater density when hillside areas are preserved. These landuses are shown spatially in Figure 2-6.



CITY OF BANNING LANDUSE AT BUILDOUT *

* Buildout is defined as maximum anticipated growth within the city, estimated to occur in 2061 based on current population projections as discussed within this report.

10-May-11

Prepared by: DWB. Map Projection: UTM 1927, Zone 11.

DRAFT

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GEOSCIENCE Support Services, Inc.
P.O. Box 220, Claremont, CA 91711
Tel: (909) 451-6650 Fax: (909) 451-6638
www.gssiwater.com

Figure 2-6

GIS_proj/city_of_banning_2010_UWMP_4-11/0_Fig_2-6_portrait_landuse_5-11.mxd

Table 2-5
City of Banning General Plan Landuses at Buildout

Landuse Designation	City Limits		SOI		Planning Area		Total
	Acres Developed	Acres Vacant	Acres Developed	Acres Vacant	Acres Developed	Acres Vacant	Acres
Single and Multi-Family Residential							
Rural Residential (0-1 du/ac.)	124.5	471.4	8.6	902	199.5	639.9	2,345.9
Rural Residential – Hillside (0-1 du/ac.)		56.2		78.5		269.3	404.0
Very Low Density Residential (0-2 du/ac.)	230.3	1,916.6	21.6	198.8			2,367.3
Low Density Residential (0-5 dy/ac.)	1,299.9	1,847.5	0.2	166.8	2.4	129.7	3,446.6
Medium Density Residential (0-10 du/ac.)	656.1	362.6		49.4	0.2	29.5	1,097.9
High Density Residential (11-18 du/ac.)	156.5	213.4	0.1	9.5			379.5
Mobile Home Park	116.4	14.0					130.4
Subtotal	2,583.7	4,881.7	30.5	1,405.0	202.1	1,068.4	10,171.4
Commercial							
General Commercial	203.8	252.1					455.9
Highway Serving Commercial	103.0	7.3					110.3
Downtown Commercial	86.0	11.3					97.3
Professional Office	23.0	18.6					41.6
Business Park	91.6	292.1					383.7
Subtotal	507.4	581.4					1,088.8
Industrial							
Industrial	146.7	274.1					420.8
Airport Industrial	41.6	94.2					135.8
Industrial – Mineral Resources	188.5	27.7					216.2
Subtotal	376.8	396.0					772.8

Table 2-5
City of Banning General Plan Landuses at Buildout (continued)

Landuse Designation	City Limits Acres Developed	Acres Vacant	SOI Acres Developed	Acres Vacant	Planning Area Acres Developed	Acres Vacant	Total Acres
Open Space							
Open Space – Hillside Preservation					0.2	647.1	647.3
Open Space – Park/Golf Course	246.6	877.5		21.7	29.8	15.8	1,191.4
Open Space – Resources	122.7	2,658.3	25	1,599.4	1.2	230.0	4,636.6
Subtotal	369.3	3,535.8	25	1,621.1	31.2	892.9	6575.3
Agricultural							
Ranch/Agricultural (1 du/10 ac.)		77.7	74	724.7	29.6	631.6	1,537.6
Ranch/Agricultural – Hillside Preservation (1 du/10 ac.)	121.8	351.5	16.7	1,536.4	18.7	421.1	2,466.2
Subtotal	121.8	429.2	90.8	2,261.1	48.3	1,052.7	4,003.8
Public Facilities							
Airport	72.3	72.1					144.4
Cemetery	12.9	2.5					15.4
Fire Station	3.5	0.1		2.9			6.5
Government	24.3	39.7					64.0
Hospital	10.6	0.3					10.9
RR/Interstate	419.3	48.9					468.2
School	137.9	95.7					233.6
Subtotal	680.8	259.3		2.9			943
Total*	**4,639**[1]	**10,083**	**146.2**	**5,290.1**	**281.6**	**3,014**	**23,455**

[1] It should be noted that totals reflected in this table, sum the acreage shown in the City of Banning General Plan Buildout Summary, however totals in the Buildout Summary table were not summed correctly in the General Plan, for example, the total for "Acres Developed" within City Limits in the General Plan Table III-1 show 4,739.9 acres, however, if the values for acreage are summed, it totals 4,639 as reflected within this UWMP, therefore comparison of two tables would appear inconsistent.

3.0 SYSTEM DEMANDS

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

(e) (1) Quantify, to the extent records are available, past and current water use, over the same five-year increments described in subdivision (a), and projected water use, identifying the uses among water use sectors including, but not necessarily limited to, all of the following uses:

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

(2) The water use projections shall be in the same 5-year increments to 20 years or as far as data is available.

Law 10631.1: *(a) The water use projections required by Section 10631 shall include projected water use for single-family and multifamily residential housing needed for lower income households, as defined in Section 50079.5 of the Health and Safety Code,*

Law 10608.20: *(e) An urban retail water supplier shall include in its urban water management plan required pursuant to Part 2.6 (commencing with Section 10610) due in 2010 the baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data.*

Law 10631: *(k) Urban water suppliers that rely upon a wholesale agency for a source of water shall provide the wholesale agency with water use projections from that agency for that source of water in five-year increments to 20 years or as far as data is available. The wholesale agency shall provide information to the urban water supplier for inclusion in the urban water supplier's plan that identifies and quantifies, to the extent practicable, the existing and planned sources of water as required by subdivision (b), available from the wholesale agency to the urban water supplier over the same five-year increments, and during various water-year types in accordance with subdivision (c). An urban water supplier may rely upon* *water supply information provided by the wholesale agency in fulfilling the plan informational requirements of subdivisions (b) and (c).*

Law 10608.36: *Urban wholesale water suppliers shall include in the urban water management plans required pursuant to Part 2.6 (commencing with Section 10610) an assessment of their present and proposed future measures, programs, and policies to help achieve the water use reductions required by this part.*

3.1 Water Demands

3.1.1 Past and Current Water Use

Amendments to the UWMP Act since the 2005 UWMP reports were submitted include the passing of California Governor Schwarzenegger's 20x2020 Plan, ultimately referred to as the Water Conservation Act of 2009. In an effort to ensure sufficient water supply to support a growing population, the state legislation requires a per capita reduction in water use by 20% by December 31, 2020. In order to achieve the Water Conservation Act of 2009, an interim goal of 10% per capita reduction in water use by December 31, 2015 has been established. As part of the Water Conservation Act of 2009 the deadline for submittal of the 2010 UWMP was extended to July 1, 2011. The proposed reduction targets for the City of Banning are discussed in Section 3.2, demand projections including reduction targets are subsequently discussed.

Projected water use has been estimated using two different methods as a way to cross check each value and to be consistent with the 2005 UWMP. The following sections discuss the methods used to determine projected water demands in the City of Banning using population growth estimates and landuse estimates as anticipated in the City of Banning General Plan, 2006.

3.1.2 Projected Water Demands by Population Growth

The City of Banning 2008 Draft Housing Element Update for years 2008-2014 estimates a population growth rate of 2% per year and 2.7 people per dwelling unit. The average annual water demand was calculated by determining a water use factor per dwelling unit of 0.52 acre-ft/yr. The value was calculated by taking the average residential water use demand per dwelling unit for 2005-2010 multiplied by the average system losses for the same time period. The number of occupied residential dwelling units were estimated by the California Department of Finance (CDOF) for years 2005-2009, 2010 values were obtained from the CDOF 2010 Census. System losses were obtained from metered water deliveries reported in the DWR Public Water System Statistics for the City of Banning which shows that well production exceeds the amount measured at individual accounts. These losses are due to several factors, including inaccurate meters, main flushing, fire flows, water hydrant testing, street cleaning, distribution system maintenance, and leaks. In 2010 approximately 10.5% of water produced was lost due to the above factors. The calculated average loss for period 2005 - 2010 is 7.8%. The annual water statistics reports submitted to the DWR for years 2000 – 2010 are provided as Appendix E

Using the City of Banning's metered water delivery records, which establishes water usage based on water use sectors (i.e. Residential, Commercial etc), the historical contribution of water use by sector type was determined. A 6-year average (2005-2010) percentage of water use by sector (see Appendix E) was obtained from the DWR Public Water System Statistics annual reports. The more recent data (2005-2010) was selected as a baseline for average water use by sector because it is a better representation of current water use trends. The 6-year average indicates that the residential water use contribution is approximately 58.5% of the total water use (56.2% for single-family residential and 2.3% for multi-family residential).

Using the population growth estimate of 2% per year and the water use per dwelling unit factor of 0.52 acre-ft/yr, the residential water use was determined. Assuming that this volume constitutes 58.5%, as shown in Table 3-1, the total projected water demand by population was determined. The DWR Public Water System Statistics for the City reported 11,006 meters for the various categories in 2010. Reported water use for years 2000, 2005 and 2010 are shown in Table 3-1 to provide background water use reference points for Census demand population data.

Table 3-1
Past, Current, and Projected Water Use Based on Projected Population Growth (acre-ft/year)

Water Use Sectors	Average % Use of Water Supply 2005-2010[1]	2000[2]	2005[2]	2010[2]	2015	2020	2025	2030	2035
Population[3]		23,562	28,250	29,603	32,684	36,086	39,842	43,989	48,567
Number of Dwelling Units[4]		8,923	10,554	10,838	12,105	13,365	14,756	16,292	17,988
Residential @ 0.52 AF/DU	58.5%	4,744	5,088	4,532	6,295	6,950	7,673	8,472	9,354
Single Family Residential	56.2%	4,649	4,986	4,412	6,049	6,678	7,373	8,141	8,988
Multifamily Residential	2.3%	95	102	120	249	275	304	335	370
Commercial / Institutional	26.2%	2,160	2,401	1,908	2,821	3,114	3,438	3,796	4,191
Industrial	1.2%	83	123	95	126	139	153	169	187
Irrigation	11.9%	1,037	1,052	939	1,279	1,412	1,559	1,722	1,901
Other[5]	1.1%	6	13	31	117	129	143	157	174
Wholesale to other Agencies[6]	1.1%	0	100	82	120	132	146	161	178
Total		**8,031**	**8,776**	**7,586**	**10,760**	**11,880**	**13,117**	**14,482**	**15,989**

[1] Average water use per water use sector based on DWR Public Water System Statistic provided by the City of Banning for years 2005 - 2010.
[2] Values for 2000, 2005 and 2010 are actual water use values. Population and housing estimates for 2000 and 2010 from CDOF Census, 2005 population and housing estimates from CDOF Table E-5.
[3] Population projections assumed to increase by 2% per year based on the City of Banning 2008 Draft Housing Element Update for years 2008-2014 and California State Department of Finances estimates for 2008 and 2009
[4] The City of Banning 2008 Draft Housing Element Update for years 2008-2014 estimates 2.7 people per equivalent dwelling units (EDUs)
[5] Other Category encompasses water connections to construction sites (per personal communication with City of Banning Public Works Superintendent, Mr. Perry Gerdes, 2010).
[6] The City began water distribution to High Valley Water District in 1999 and has delivered an average of 98 acre-ft/yr between 2005 and 2010.

3.1.2.1 Low-Income Housing

The City of Banning currently does not offer a rate decrease for low income housing, however, the 2006 General Plan states that there is County funded and operated programs to assist low income families with utilities such as water. Under the County of Riverside Rental Certificate Program, the tenant is generally required to pay 30 percent of adjusted monthly income toward rent and utilities. The Housing Assistants Payment (HAP) made by the Public Housing Authority (PHA) to the owner makes up the difference between the rent the owner charges for the unit and the amount of the tenant's total tenant payment.

The infrastructure which serves the low income housing is not individually metered—meaning a multifamily water account can represent 2 or even 50 homes, therefore, there is no way to determine low income water use demand from estimates of general residential demand. Projected water demands by population growth discussed in Section 3.1.2 for residential purposes are calculated on a per dwelling unit bases and would include those dwelling units considered low income.

The City of Banning Housing Element of the General Plan, December 2008 states that:

> *"The State periodically establishes an overall goal for construction of new housing units and makes an assignment of gross allocations of housing unit goals to regional governments, which in turn allocate the housing unit goals to counties and cities. The document produced by regional governments is referred to as the "Regional Housing Needs Assessment" (RHNA).*
>
> *While the City has installed mechanisms to allow for low and very low-income housing, due to lack of developer interest and market factors beyond the City's control, the City did not meet the RHNA affordable housing goals. The City achieved approximately 25.8 percent of the RHNA goals for extremely low, very low, and low income households. The City implemented its affordable housing strategy as outlined in the 1998-2005 Housing Element, but due to the rise in the market value of single family housing and the demand for condominium style housing, developers only produced housing affordable to the moderate and above moderate income households. The City has retained the minimum number of housing choice vouchers and several multi-family complexes have maintained their affordability, most recently, the Westview Terrace Apartments."*

The Housing Element states that the City constructed 168 dwelling units (21.9% of the 1998 - 2005 RHNA goal of 766 dwelling units) classified as very-low or low income housing, an objective outlined in this report states that an additional 1,532 homes (2008 - 2014 RHNA goal) will be either newly constructed, rehabilitated or undergo conservation measures by the year 2014. Based on a water demand estimate of 0.52 acre-ft/yr per dwelling unit estimates described in the previous section, it is estimated that the demand for low income housing in 2008 and 2014 is 87 acre-ft/yr and 797 acre-ft/yr respectively. Based on the time frame at which low income housing is being generated the objective of 1,532 homes by 2014 is unlikely and the 797 acre-ft should be anticipated in the future at an unknown date.

3.1.3 Projected Water Demands by Land Development

Future water demands can be projected based on the expected development in the region. Table 2-5 shows a projected increase in agricultural lands, rural residential lands, and open spaces. These increases reflect the City's commitment to preserving hillsides and open spaces for the enjoyment of its citizens. However, these landuses do not require connection to the City's water system, and therefore, were not included in the determination of water demand based on acreage of future landuse, Table 3-2 shows land use used for this determination. Water demand, as it corresponds to landuse, was determined using the water use factors reported in the *City of Banning Water System Hydraulic Modeling Report* (Montgomery Watson Harza, 2002) and is assumed to include water loss.

The City of Banning's General Plan, adopted January 2006, summarized the acreage of developed land and land available for development within the City's limits, sphere of influence, and planning area and is shown in Table 3-2, these developed land acreages are assumed to be as of 2006, when the General Plan was adopted. The greatest percent increase in development will be in the residential and irrigation sectors. Commercial, and industrial sectors will approximately double at buildout. Public Facilities will increase by approximately 30%.

Table 3-2 - Total Acreage Used for Water Demand by Landuse Designation at Buildout

Landuse Designation	City Limits		SOI		Planning Area		Total	
	Acres Developed	Acres Vacant	Acres Developed	Acres Vacant	Acres Developed	Acres Vacant	Acres Developed	Acres at Buildout
Single and Multi-Family Residential								
Rural Residential (0-1 du/ac.)	124.5	471.4	8.6	902.0	199.5	639.9	332.6	2,345.9
Very Low Density Residential (0-2 du/ac.)	230.3	1,916.6	21.6	198.8			251.9	2,367.3
Low Density Residential (0-5 du/ac.)	1,299.9	1,847.5	0.2	166.8	2.4	129.7	1,302.5	3,446.5
Medium Density Residential (0-10 du/ac.)	656.1	362.6		49.4	0.2	29.5	656.3	1,097.8
High Density Residential (11-18 du/ac.)	156.5	213.4	0.1	9.5			156.6	379.5
Mobil Home Park	116.4	14.0					116.4	130.4
Subtotal	2,584	4,826	31	1,327	202	799	2,816	9,767
Commercial								
General Commercial	203.8	252.1					203.8	455.9
Highway Serving Commercial	103.0	7.3					103.0	110.3
Downtown Commercial	86.0	11.3					86.0	97.3
Professional Office	23.0	18.6					23.0	41.6
Business Park	91.6	292.1					91.6	383.7
Subtotal	507	581	0	0	0	0	507	1,089

Source: City of Banning General Plan, adopted in 2006. Note that only landuse anticipated to be connected to the water system is represented in this table.

Table 3-2 - Total Acreage Used for Water Demand by Landuse Designation at Buildout (continued)

Landuse Designation	City Limits		SOI		Planning Area		Total	
	Acres Developed	Acres Vacant	Acres Developed	Acres Vacant	Acres Developed	Acres Vacant	Acres Developed	Acres at Buildout
Industrial								
Industrial	146.7	274.1					146.7	420.8
Airport Industrial	41.6	94.2					41.6	135.8
Industrial – Mineral Resources	188.5	27.7					188.5	216.2
Subtotal	377	396	0	0	0	0	**377**	**773**
Irrigation								
Open Space – Park/Golf Course	246.6	877.5		21.7	29.8	15.8	276.4	1,191.4
Subtotal	247	878	0	22	30	16	276	1,191
Public Facilities								
Fire Station	3.5	0.1		2.9			3.5	6.5
Government	24.3	39.7					24.3	64.0
Hospital	10.6	0.3					10.6	10.9
Airport	72.3	72.1					72.3	144.4
RR/Interstate	419.3	48.9					419.3	468.2
Cemetery	12.9	2.5					12.9	15.4
School	137.9	95.7					137.9	233.6
Subtotal	680.8	259.3	0.0	2.9	0.0	0.0	680.8	943.0
Total	**4,395**	**6,940**	**31**	**1,351**	**232**	**815**	**4,658**	**13,763**

Source: City of Banning General Plan, adopted in 2006. Note that only landuse anticipated to be connected to the water system is represented in this table.

Projected water use by landuse designation is summarized in Table 3-3. The date of final buildout is unknown, however, the City's General Plan estimates the population to be 80,226 at buildout. If the population were to continue to grow at the rate projected by City of Banning 2008 Draft Housing Element Update for years 2008-2014 forecasts (projecting a rate of 2% after the year 2010), this population wouldn't occur until 2061. Developed acres as reflected in the General Plan are assumed to be as of 2006, total acres at buildout are estimated to occur in 2061, due to the unknown time period of when development will occur, a linear relationship is assumed to estimate projected water use based on land use. Please note that water use projection based on landuse for 2010 is considerably higher than actual water use reported by the City for 2010 (7,586 acre-ft) this suggests that the projected water use by landuse is conservative, however was included to be consistent with the 2005 UWMP.

Table 3-3
Total Projected Water Use Based on Land Use

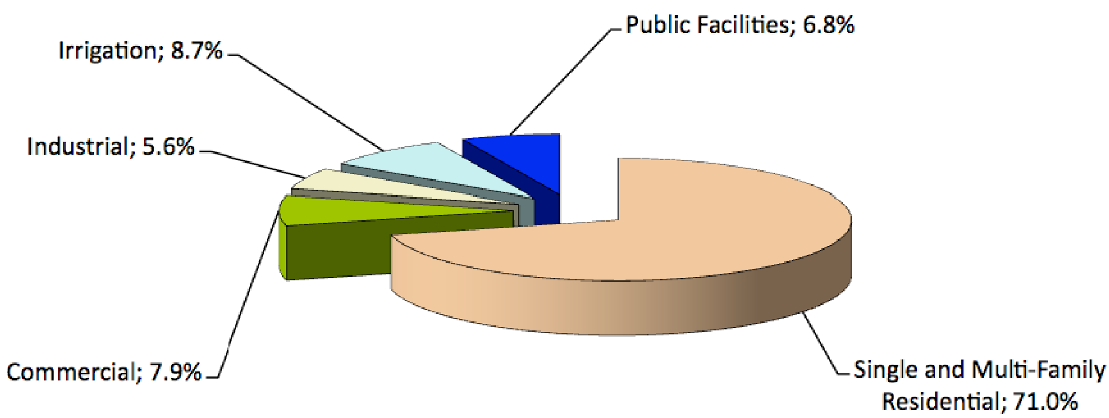
Water Use Sectors	2010 [acre-ft]	2015 [acre-ft]	2020 [acre-ft]	2025 [acre-ft]	2030 [acre-ft]	2035 [acre-ft]
Residential	9,257	10,842	12,427	14,013	15,598	17,183
Commercial	665	729	793	857	921	985
Industrial	483	523	563	603	643	683
Irrigation	1,180	1,466	1,752	2,038	2,324	2,610
Public	1,142	1,176	1,211	1,245	1,279	1,314
Total	**12,726**	**14,736**	**16,746**	**18,755**	**20,765**	**22,775**

Table 3-4 shows current and future land use values as percentage of land contribution, future land use contributions are shown graphically on Figure 3-1.

Table 3-4
Land Use Percentage by Water Use Sector

Water Use Sectors	2006 Land Use (%)	Future Land Use at Buildout (%)
Residential	60.5%	71.0%
Commercial	10.9%	7.9%
Industrial	8.1%	5.6%
Irrigation	5.9%	8.7%
Public	14.6%	6.8%

Figure 3-1
Land Use Percentage by Water Use Sector
At Buildout (2061)



3.1.3.1 Multiple and Single-Family Residential

Individual single family, condominiums, apartments, and mobile home living units characterize the residential use sector. Water consumption within this sector is comprised of indoor and outdoor uses. Indoor water use includes sanitation, bathing, laundry, drinking, and cooking. Outdoor water use is primarily for landscape irrigation, but also includes washing automobiles, maintaining swimming pools, and cleaning sidewalks and driveways. Rural residential landuses allow for animal husbandry and would also be served under residential water accounts.

While population is increasing, housing density is increasing as well because hillside density transfers are applied to rural and agricultural residential areas. This will result in a decrease in residential irrigation on a per capita basis.

3.1.3.2 Commercial

The City of Banning's commercial landuse sector includes a variety of customers, including office buildings, restaurants, hotels, automobile repair and gas stations, grocery stores, shopping centers, and other facilities serving the public.

3.1.3.3 Industrial

The City's industrial sector has historically been divided between airport-industrial related uses and traditional industrial uses, ranging from storage to heavy manufacturing. Industrial development has been an important source of employment in the City and areas will be designated within the City for continued development; however, at buildout, the industrial sector is expected to make up approximately 5.6 percent of total landuse.

3.1.3.4 Public Facilities

The City's public facilities include governmental institutions, such as City Hall, prisons, fire and police stations, and hospitals, as well as railroads, interstate highways, schools (public and private), and airport operations such as administration offices, hangars, tiedowns, and runways. Public facilities also include non-governmental institutions such as cemeteries. This sector will continue to expand as the City grows.

3.1.3.5 Irrigation

The City plans to set aside approximately a quarter of the land within the City boundaries, sphere of influence, and planning area for open space, including lands preserved for natural resources, hillside preservation, and recreation. Most of this land will not require connections to the City's water system. The City's landscaped areas include irrigated green space such as parks and golf courses. Following the completion of Phase I of the City's Wastewater Treatment Plant, recycled water can be utilized to meet a portion of these water demands.

3.1.3.6 Agricultural

The only agriculture within the City of Banning is animal husbandry. The City does not expect other agricultural activities to take root within their jurisdiction; however, land previously designated for agricultural purposes with a slope of 25% or greater is expected to be set aside for hillside preservation.

3.2 Baseline and Water Use Targets

Water conservation reduces demand that typically rises over time with growth in population and commerce. By mitigating those increases in demand, water supply reliability is improved while costs are reduced.

The Water Conservation Act of 2009, Senate Bill x7-7 (SBx7-7), requires water agencies to reduce per capita water use by 20% by the year 2020 (20x2020). This includes increasing recycled water use to offset potable water use. Water suppliers are required to set a water use target for 2020 (20% reductions) and an interim target for 2015 (10% reductions) using one of four methods. The 2020 urban water use target may be updated in a supplier's 2015 UWMP. Failure to meet adopted targets will result in the ineligibility of a water supplier to receive water grants or loans administered by the State unless one of two exceptions is met. Exception one states a water supplier may be eligible if they have submitted a schedule, financing plan, and budget to DWR for approval to achieve the per capita water use reductions. Exception two states a water supplier may be eligible if an entire water service area qualifies as a disadvantaged community.

Table 3-5 below indicates that the City of Banning has not used recycled water to date and therefore a 10-year baseline beginning in 2001 and ending in the year 2010 was used for establishing the baseline per capita water use.

Table 3-5
Base Year Determination

Base	Parameter	Value	Units
10 - Year Base Period	2008 Total Water deliveries	9,605	acre-ft
	2008 Total Volume of Delivered Recycled Water	0	acre-ft
	2008 recycled water as a percent of total deliveries	0	acre-ft
	Number of years in Base Period[1]	10	years
	Year beginning base period range	2001	years
	Year ending base period range[2]	2010	years

[1] If the 2008 recycled water percent is less than 10 percent, then the first base period is a continuous 10-year period.
[2] The ending year must be between December 31, 2004 and December 31, 2010.

Four methodologies are stipulated for calculating the water use target as defined by the DWR. Three of the methods are listed in California Water Code (CWC) 10608.20(a)(1). The fourth method was developed by DWR and an advisory committee according to the CWC 10608.20(b)(4). The four methodologies are:

- Method 1 - Eighty percent of the water supplier's baseline per capita water use.
- Method 2 – Per capita daily water use estimated using the sum of performance standards applied to indoor residential use; landscape area water use, and commercial, industrial, and institutional uses.
- Method 3 – Ninety-five percent of the applicable state hydrologic region target as stated in the state's draft 20x2020 Water Conservation Plan.
- Method 4 – Water savings (provisional)[1].

Table 3-6 provides a tabulation of population, values estimated by the California Department of Finance for years 2001-2009 and the 2010 Census for 2010 population, over the base period along with gross water use. The baseline per capita water use is calculated at 315 gallons per day per capita. The baseline and targets are developed for the City of Banning water supply service area only. For consistent application of the Act, DWR produced *Methodologies for Calculating Baseline and Compliance Urban Water Per Capita Use* in October 2010. Using guidelines provided in the document the 2020 urban water use per capita and the interim 2015 per capita reductions were established in compliance of DWR Method 1.

[1] Method 4: Water savings is considered provisional as it will be updated in 2014, as required by CWC 10608.20(d).

Table 3-6
Base Daily Per Capita Water Use - 2001 through 2010

Base Period Year: Sequence Year	Base Period Year: Calendar Year	Distribution System Population[1]	Daily System Gross Water Use (mgd)	Annual Daily Per Capita Water Use (gpcd)
Year 1	2001	24,639	8.95	363
Year 2	2002	25,662	8.75	341
Year 3	2003	27,608	8.96	324
Year 4	2004	28,055	9.30	332
Year 5	2005	28,250	8.41	298
Year 6	2006	28,234	9.14	324
Year 7	2007	28,193	9.14	324
Year 8	2008	28,551	8.57	300
Year 9	2009	28,751	8.26	287
Year 10	2010	29,603	7.57	256
		Base Daily Per Capita Water Use[2]		**315**

[1]Population values were taken from the CDOF Table E-5, however please note that data estimated for January 1 of each year was used as the ending population estimate for the previous year (e.g. population estimate for January 1, 2010 in CDOF Table E-5 is 28,751. This value is used for the year 2009 above). Population value for 2010 was taken from the 2010 Census data dated April 1, 2010.
[2] Average daily per capita water use for the base period is calculated by dividing the daily system gross water use converted to gallons per day by the total population for the year and then taking the average daily per capita water use for the base period 2001 through 2010.

The baseline per capita water use is 315 gpcd using a ten-year average ending between January 1, 2001 and December 31, 2010. The 2015 interim reduction of 10% is 283 gpcd and the 2020 reduction of 20% is 252 gpcd as shown in Table 3-7.

Table 3-7
20x2020 Base and Target Data

20x2020 Required Data	Gallons Per Capita Per Day (gpcd)
Base Per Capita Daily Water Use	
10-Year Average	315
Target Using Method 1	
2015 Target (10% reduction)	283
2020 Target (20% reduction)	252

3.3 The City of Banning Demands Incorporating 20x2020 Reductions

Demands were estimated using the methods described in Section 3-2 to determine target per capita reductions. The two methods for determining demand were population growth, as described in Section 3.1.2, and land use, as described in Section 3.1.3. For purposes of estimating reductions per capita the method used for population growth was used to determine projected demands incorporating 20x2020 reductions.

Table 3-8 shows estimated water use demands based on population growth incorporating 20x2020 reductions. The per capita water use in gal per day was multiplied by population estimates provided in Table 2-3 and converted to acre-ft per year. The individual water use sector demands were estimated based on a 6-year average (2005-2010) percentage of water use by sector as described in Section 3.1.2 and shown in Table 3-1.

Table 3-8 – City of Banning Water Demands
Based on Population Growth Estimates Including 20x2020 Reductions

Water Use Sectors	Average % Use of Water Supply 2005-2010	2010*	2015	2020	2025	2030	2035
Population		29,603	32,684	36,086	39,842	43,989	48,567
Per Capita Water Use [gpcd]		229[1]	283[1]	252	252	252	252
Single Family Residential	56.2%	4,412	5,833	5,724	6,320	6,978	7,704
Multi-family Residential	2.3%	120	240	236	260	288	317
Commercial / Institutional	26.2%	1,908	2,720	2,669	2,947	3,254	3,593
Industrial	1.2%	95	121	119	131	145	160
Irrigation	11.9%	939	1,233	1,211	1,337	1,476	1,629
Other	1.1%	31	113	111	122	135	149
Sales to other Agencies	1.1%	82	116	113	125	138	153
Total [acre-ft/yr]		**7,586**	**10,376**	**10,183**	**11,243**	**12,413**	**13,705**

*2010 values are actual water use for 2010.
[1] Per capita water use values are rounded to the nearest whole number.

3.3.1 Achieving Future Water Use Reductions

The demand projections included in Table 3-8 will be achieved through a combined use of recycled water, conservation within new developments and retrofitting of existing infrastructures. The estimated total savings utilizing the 20x2020 reductions from the baseline per capita water use (see Table 3-7) in 2015 and 2020 are 1,160 acre-ft/yr and 2,523 acre-ft/yr respectively.

The projected water demand reductions are based on water conservation and improved water use efficiency measures and requirements that have been enacted in the City and are required by the state. The expected reductions have been applied primarily to future new residential and non-residential water demand, including commercial, industrial, institutional, public and other uses, and to a small percentage of existing residences. These estimates are conservative since additional existing residential and non-residential water uses within the City are expected to also experience water demand reductions as rehabilitation, alterations and redevelopment of these infrastructures take place.

Groundwater management, water conservation and the effective use of recycled water generated within the city are the primary elements of the City's long-term strategy for meeting its customers' water needs. The goals of the City's water conservation program are to reduce water demands, demonstrate a commitment to best management practices (BMPs), and ensure reliable water supplies[2].

[2] City of Banning, Clean & Green: Report and Recommendations (June 2008) ("Clean & Green Report"), pp. 10-11; 2005 UWMP, pp. 7-2 to 7-11; Banning, Cal., Mun. Code ch. 13.16.030 (2010).

4.0 SYSTEM SUPPLIES

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

(b) Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments as described in subdivision (a). If groundwater is identified as an existing or planned source of water available to the supplier, all of the following information shall be included in the plan:

1) (Provide) A copy of any groundwater management plan adopted by the urban water supplier, including plans adopted pursuant to Part 2.75 (commencing with Section 10750), or any specific authorization for groundwater management.

2) (Provide) A description of any groundwater basin or basins from which the urban water supplier pumps groundwater. For those basins for which a court or the board has adjudicated the rights to pump groundwater, a copy of the order or decree adopted by the court or the board and a description of the amount of groundwater the urban water supplier has the legal right to pump under the order or the decree. For basins that have not been adjudicated, information as to whether the department has identified the basin or basins as overdrafted or has projected that the basin will become overdrafted if present management conditions continue, in the most current official departmental bulletin that characterizes the condition of the groundwater basin, and a detailed description of the efforts being undertaken by the urban water supplier to eliminate the long-term overdraft condition.

3) A detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

4) A detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the urban water supplier. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

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

(i) Describe the opportunities for development of desalinated water, including, but not limited to, ocean water, brackish water, and groundwater, as a long-term supply.

Law 10633: *The plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. The preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area, and shall include all of the following:*

(a) A description of the wastewater collection and treatment systems in the supplier's service area, including a quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.

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

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

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

(e) The projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected pursuant to this subdivision.

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

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

Law 10631: *(h): Include a description of all water supply projects and water supply programs that may be undertaken by the urban water supplier to meet the total projected water use as established pursuant to subdivision (a) of Section 10635. The urban water supplier shall include a detailed description of expected future projects and programs, other than the demand management programs identified pursuant to paragraph (1) of subdivision (f), that the urban water supplier may implement to increase the amount of the water supply available to the urban water supplier in average, single-dry, and multiple-dry water years. The description shall identify specific projects and include a description of the increase in water supply that is expected to be available from each project. The description shall include an estimate with regard to the implementation timeline for each project or program.*

4.1 Current and Planned Water Supplies and Sources

The City of Banning's existing and planned water supply sources, in acre-ft/yr, are shown in Table 4-1 and represented graphically on Figure 4-1. Historically the City has extracted ground water from the Banning, Banning Bench, Banning Canyon, Beaumont and Cabazon Storage Units. The Boundaries of these storage units are shown on Figure 4-2. With the exception of the Beaumont and Cabazon Storage Units, ground water supplies for each storage unit reflect the average value within the range of the maximum perennial yield, as established in the *Maximum Perennial Yield Estimates for the Banning and Cabazon Storage Units, and Available Water Supply from the Beaumont Basin* (Geoscience, 2011) provided in Appendix F. Beaumont supply values are the average production by the City since the basin was adjudicated in 2004, and have been consistently less than the available adjudicated rights. Cabazon supplies are the average production from Well C-6, which is the City's only active production well in

Cabazon[3], since the well became operable in 2004. Return flows from irrigation are also included in Table 4-1, as well as current and projected volumes of State Water Project (SWP) water received from the SGPWA who is a wholesale supplier to the City.

Table 4-1
Current and Projected Water Supplies
for the City of Banning [acre-ft]

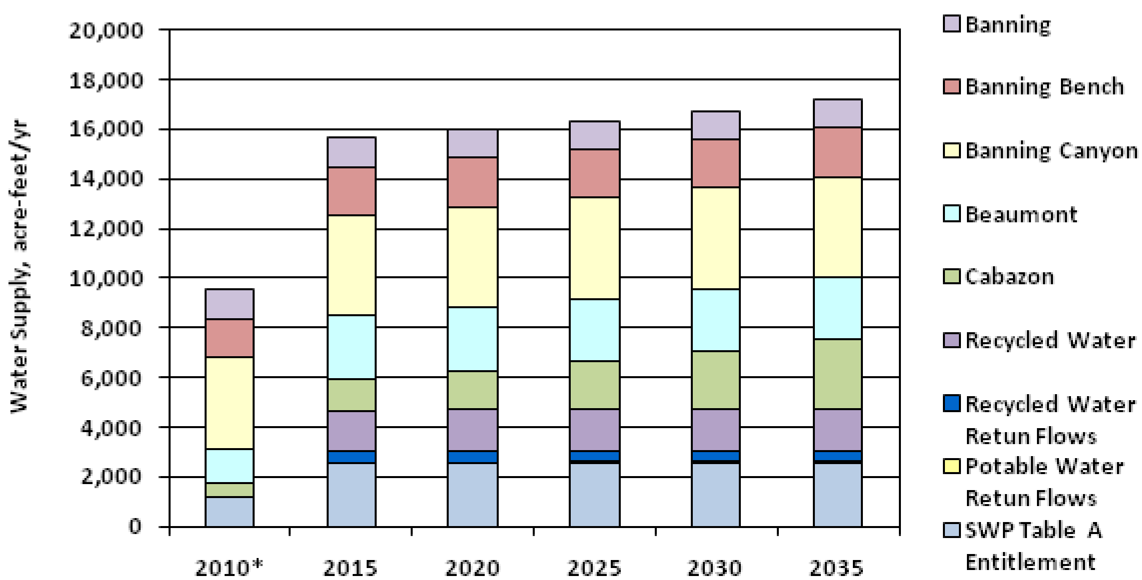
Water Supply Source	2010*	2015	2020	2025	2030	2035
Banning Storage Unit[1]	1,218	1,130	1,130	1,130	1,130	1,130
Banning Bench Storage Unit[1]	1,472	1,960	1,960	1,960	1,960	1,960
Banning Canyon Storage Unit[1]	3,726	4,070	4,070	4,070	4,070	4,070
Beaumont Storage Unit[2]	1,372	2,514	2,514	2,514	2,514	2,514
Cabazon Storage Unit[3]	565	1,185	1,405	1,648	1,916	2,212
Recycled Water Supply[4]	0	1,680	1,680	1,680	1,680	1,680
Return Flows from Recycled Water Irrigation[5]		420	420	420	420	420
Return Flows from Potable Residential Irrigation[6]	0	9	18	28	38	48
SWP Table A Entitlement[7]	1,200	2,595	2,595	2,595	2,595	2,595
Total	**9,552**	**15,563**	**15,792**	**16,045**	**16,323**	**16,628**

* 2010 values are actual supplies utilized by the City in 2010. The DWR Guidebook requires inclusion of 2010, however as the deadline for submittal of the UWMP has been extended to 2011, all 2010 values are not projections or estimates, but are actual values.
[1] Maximum Perennial Yield Estimates for the Banning and Cabazon Storage Units, and Available Water Supply from the Beaumont Basin, Geoscience 2011.
[2] City of Banning average annual production from City of Banning Wells within the Beaumont Storage Unit since the basin was adjudicated in 2004.
[3] Cabazon production supply includes approximately 710 acre-ft/yr, which has been the average annual production from the City of Banning Well C-6, and additional water which may be utilized by the City as described in Maximum Perennial Yield Estimates Report, Geoscience, 2011 (see Appendix F). See Section 4.2.7 for explanation of estimates. These values assume that Phase I of the WWTP Expansion will be completed by 2014, and 1,680 acre-ft/yr will be treated to Tertiary standards and used to offset potable demand, therefore the 1,680 acre-ft/yr is excluded from these estimates.

[3] The City constructed an additional well in the Cabazon Storage Unit near the wastewater treatment plant in 1991, Well R-1, which is currently inactive.

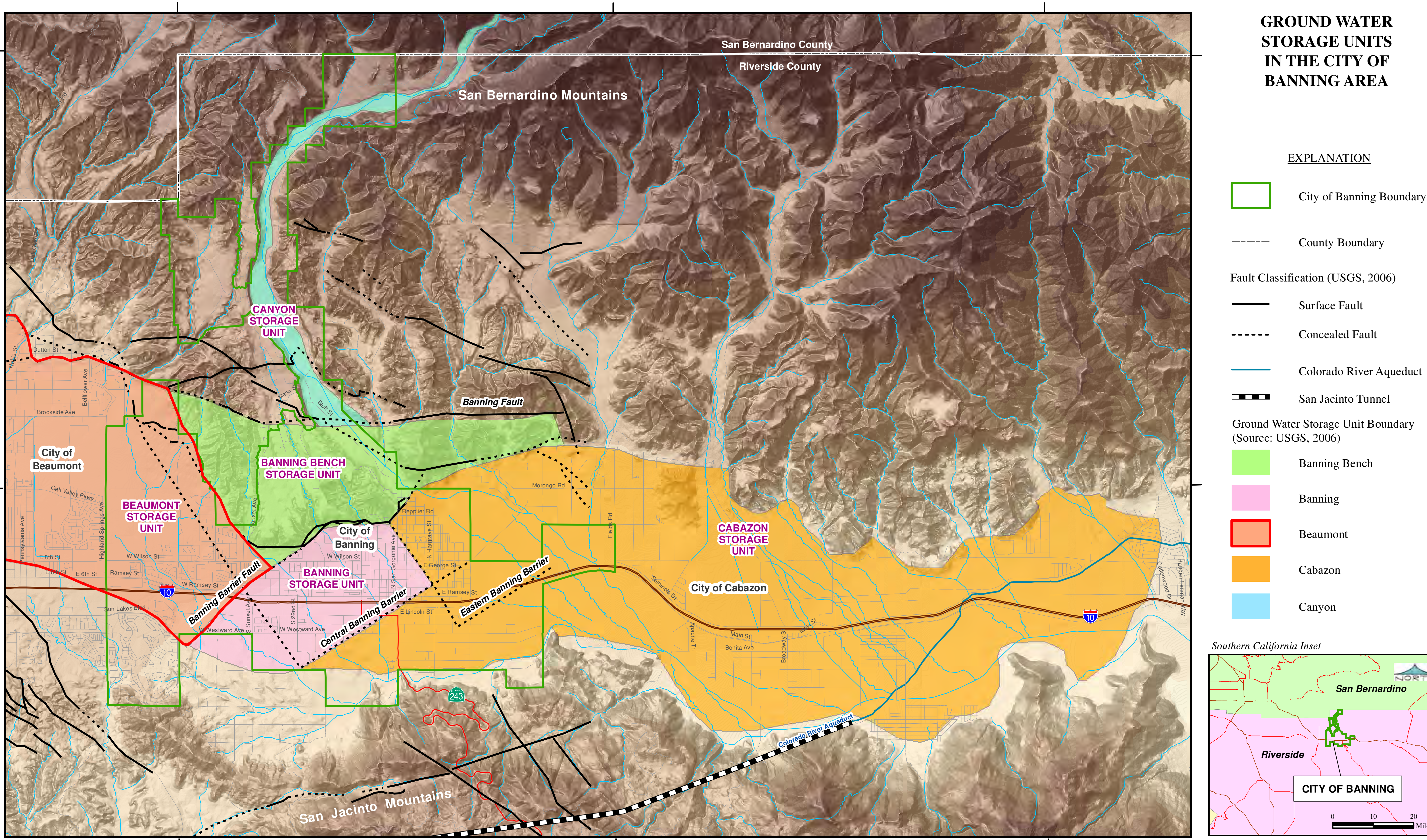
Notes from Table 4-1 continued:
[4] Values from Initial Study/Mitigated Negative Declaration, Wastewater Treatment Plant Expansion and Phase I Recycled Water System, May 2008 prepared by the City of Banning Water/Wastewater Utilities Department. Assumes WWTP Phase I will be completed by 2015. It is assumed that supply will increase by 1.5 MGD/ 1,680 AFY every ten years.
[5] Values include 25% return flow from all irrigation purposes inside and outside the BMZ for Phase I and Phase II WWTP expansion project Assumes Phase I will be completed in 2014.
[6] Values include 25% return flow from all irrigation purposes where potable water is used (50% of residential water use is used for landscape irrigation). Returns flows for Beaumont Storage Unit are not counted, as the City has an allotment of the Safe Yield. All return flows within the Beaumont Basin from imported water are dedicated for overdraft mitigation. Return flows in the Banning Storage Units are considered for developments projected for construction which will add new recharge to the storage units (total of 1,044 EDUs at build out - assumed to be 2061) along with 20X2020 conservation.
[7] Assumes 60% SGPWA SWP average reliability per DWR's Final Reliability Report 9/27/10; Assumes Banning's allocation of available SWP water is 25% of SGPWA Allotment, assumes EBX-II is on line by 2014.

Figure 4-1
Current and Projected Water Supplies
for the City of Banning



* 2010 values are actual supplies utilized by the City in 2010. The Guidebook requires inclusion of 2010, however as the deadline for submittal of the UWMP has been extended to 2011, all 2010 values are not projections or estimates, but are actual values.

GROUND WATER STORAGE UNITS IN THE CITY OF BANNING AREA



10-May-11

Prepared by: DWB. Map Projection: UTM 1927, Zone 11.

Source of Faults:
USGS Scientific Investigation Report 2006-5026, Fig. 2, 2006.

NORTH

0 1 2 Miles

DRAFT

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Figure 4-2

GIS_proj/city_of_banning_2010_UWMP_4-11/0_Fig_4-2_gw_storage_units_5-11.mxd

4.2 Ground Water Supply

4.2.1 Storage Units

The City of Banning overlies the San Gorgonio Pass Ground Water Basin. The San Gorgonio Pass Ground Water Basin includes five hydraulically-connected ground water storage units, which constitute the City of Banning ground water resource area: the Banning Storage Unit, the Banning Bench Storage Unit, the Banning Canyon Storage Unit, the Cabazon Storage Unit, and the Beaumont Storage Unit. Figure 4-2 shows the location of these storage units.

The current storage unit boundaries are those most recently defined in the 2006 USGS Scientific Investigations Report 2006-5026. The ground water storage units are defined by ground water levels, bedrock outcrops and geologic faults, which were delineated based on significant differences in static water levels between wells or lack of pumping effects observed across storage unit boundaries (USGS 2006). The effect of the faults on ground water movement is not well defined. However, it is generally known that they impede normal flow causing a difference in ground water levels across the fault, but do not prevent flow from crossing the fault.

Ground water recharge to the Banning area is obtained from precipitation infiltrating into the ground within the surface water catchments and particularly in the canyons north of the city. An additional source of recharge is subsurface inflow (i.e. underflow) from storage unit to storage unit, infiltration of Whitewater River diversions in the Banning Canyon, and from percolation of treated wastewater into the Cabazon Storage Unit. The Banning Canyon area receives water from the percolation of canyon flows through the gravelly soils of the canyon bottom. The San Gorgonio River running southerly through the Banning Canyon provides intake areas for distributing water to spreading ditches that interconnect with spreading ponds located approximately 1 mile north of the Banning Bench to enhance percolation.

4.2.2 City of Banning Production Wells

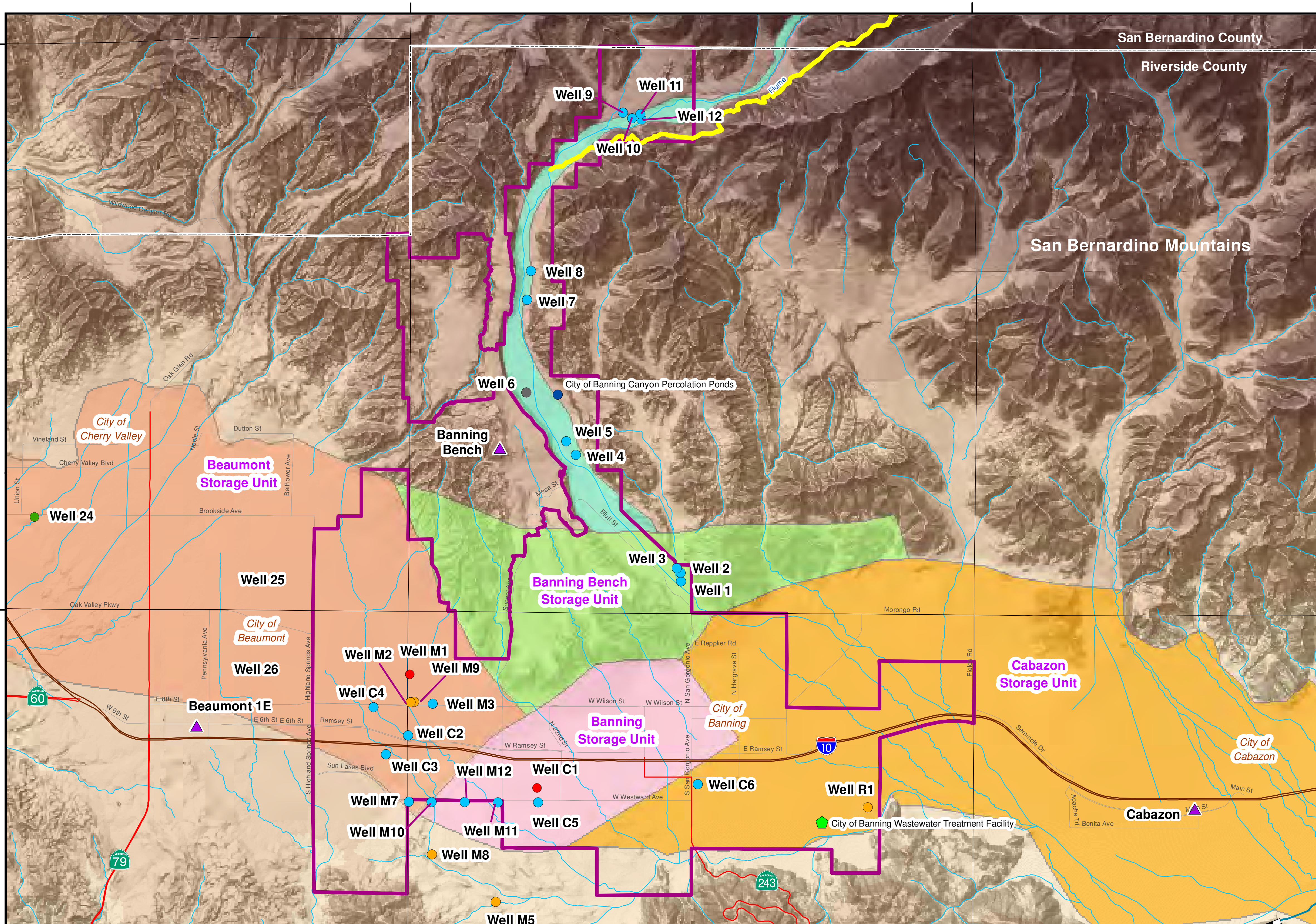
The City of Banning currently operates 21 active ground water production wells (personal communication with City of Banning Public Works Superintendent, Mr. Perry Gerdes, 2010). The City also co-owns 3 production wells within the Beaumont Storage Unit with BCVWD. These wells are co-owned and operated by Banning and BCVWD. The City is entitled to half of the water produced from these wells. An additional five wells are available but are not equipped (a total of 29 wells). The location of the City's wells in relation to the storage units are shown on Figure 4-3.

The 24 wells have a total design capacity of approximately 24,300 gpm. During dry years, the capacity of the wells decrease in response to decreased precipitation and subsequent recharge. Table 4-2 summarizes total well capacities for each storage unit for historical high capacities and dry year condition capacities, which are historical low values.

Table 4-2
City of Banning Well Capacities
by Storage Unit

Wells by Storage Unit	Well Capacity [Historical High]		Dry Year Capacity [Historical Low]	
	[gpm]	[acre-ft/year]	[gpm]	[acre-ft/year]
Banning[1]	3,500	5,646	2,850	4,597
Banning Bench[2]	3,650	5,888	2,750	4,463
Banning Canyon[3]	8,600	13,873	4,250	6,856
Cabazon[4]	900	1,452	850	1,371
Beaumont[5]	7,650	12,340	7,125	11,493
Total Capacity	**24,300**	**39,199**	**17,825**	**28,754**

[1] City Wells M10, M11, M12 and C-5 extract ground water from the Banning Storage Unit.
[2] City Wells 1 through 3 extract ground water from the Banning Bench Storage Unit.
[3] City Wells 4 through 12 extract ground water from the Banning Canyon Storage Unit.
[4] City Well C6 extract ground water from the Cabazon Storage Unit.
[5] City Wells C2A, C3, C4, M3, M7 and Banning co-owned production Wells 24, 25 and 26 extract ground water from the Beaumont Storage Unit.



CITY OF BANNING WELL LOCATIONS

EXPLANATION

City of Banning Well Classification

- Active Well
- Active Wells Co-Owned by the City of Banning and Beaumont Cherry Valley Water District
- Inactive Well
- Abandoned Well
- Destroyed Well

Cabazon — Riverside County Flood Control and Water Conservation District Weather Station

- City of Banning Boundary
- Colorado River Aqueduct
- San Jacinto Tunnel
- SCE Trans-Basin Diversion from the Upper Whitewater River Watershed

Ground Water Storage Unit Boundary (Source: USGS, 2006)

- Banning Bench
- Banning
- Beaumont
- Cabazon

10-May-11

Prepared by: DWB. Map Projection: UTM 1927, Zone 11.

NORTH

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Figure 4-3

GIS_proj/city_of_banning_2010_UWMP_4-11/0_Fig_4-3_well_locations_5-11.mxd

Table 4-3 shows the annual production per well in each storage unit for 2000 through 2010. Due to system pressure requirements, more water is extracted from the Banning Canyon wells than is needed to meet demand. The excess water is extracted from wells higher in the canyon and returned to the basin via recharge basins near Wells Nos. 4 and 7. This volume of water is shown as accounted for water in Table 4-3 and is not included in the total annual production values shown.

Table 4-3
Annual Well Production in Acre-ft by Storage Unit
2000 – 2010

Wells	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Banning Canyon											
4	396	0	0	0	0	374	771	25	0	0	756
5	681	1,407	338	479	164	0	0	114	174	0	0
6	0	0	0	0	0	0	0	0	0	0	0
7	749	590	439	1,556	1,031	989	1,594	2,230	2,204	2,233	2,297
8	1,879	1,731	779	55	719	170	897	4	0	2	0
9	3	564	588	0	0	665	170	16	0	0	0
10	615	394	796	203	816	1,130	14	251	783	532	673
11	116	94	0	76	561	249	0	0	0	0	0
12	396	672	0	0	0	0	0	0	0	0	0
Banning Bench											
1	0	0	639	865	1,245	1,802	1,579	1,132	513	521	618
2	71	25	84	12	0	82	67	152	0	46	0
3	625	339	10	0	0	485	1,278	839	917	773	854
Accounted for Water	153	99	63	65	466	96	96	13	8	12	33

Table 4-3
Annual Well Production in Acre-ft by Storage Unit
2000 – 2010
(continued)

Wells	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Cabazon											
C6	0	0	0	0	323	219	612	1,202	914	982	565
Banning											
C5	586	839	1,103	870	625	303	319	351	337	829	617
M10	0	0	0	432	232	283	54	83	353	59	1
M11	0	0	0	130	228	161	184	195	472	573	475
M12	0	0	0	949	697	519	660	683	149	345	124
Beaumont											
C2	752	1,007	1,214	1,137	711	0	6	289	432	120	27
C3	1,108	1,114	1,323	1,018	1,031	515	236	512	601	739	843
C4	1,549	1,255	1,701	980	1,145	380	273	674	696	470	51
M3	0	0	3	526	170	531	673	725	584	294	80
M7	0	0	303	344	164	74	185	173	326	211	222
M9	0	0	398	425	0	0	0	0	0	0	0
Imported from BCVWD			36	0	383	377	639	589	778	520	148
Total Annual Production[1]	**9,373**	**9,932**	**9,691**	**9,992**	**9,779**	**9,212**	**10,115**	**10,226**	**10,225**	**9,237**	**8,319**

[1] Total annual production includes production from all wells minus "accounted for water," which is recharged back into the Banning Canyon Storage Unit.

The City of Banning plans to drill new wells as the need arises. The City entered into a cooperative agreement in December 2003 with BCVWD to jointly construct and operate three new production wells, build a water treatment facility to treat SWP water, and to interconnect their existing potable water distribution systems and recycled water systems. However, to date the treatment facility and the interconnection of the recycled water systems has not taken place. The City plans to continue discussions of the interconnection of the recycled water following the completion of Phase I expansion of the Wastewater Treatment Facility as discussed in Section 4.6.1. Currently the City can meet demand with the existing sources of potable water based on water demand by population estimates, however based on water demand by landuse predictions, the demand will exceed average supply and additional production either from existing wells or additional wells will be necessary. However, it should be noted that water demand based on landuse is assumed to be conservative based on comparison of estimated water use in 2010 and actual water use in 2010, as described in Section 3.1.3.

4.2.3 Beaumont Storage Unit

The Beaumont Storage Unit covers approximately 19.5 square miles and is bounded on the north by the Banning and Cherry Valley Faults and on the south and east by the San Timoteo Canyon Fault, and the west by the Banning and Central Banning Faults. A portion of the Beaumont Storage Unit is located within the Banning, Calimesa and Cherry Valley city limits; however, this storage unit is primarily located within the City of Beaumont. BCVWD, South Mesa Water District (SMWD), Yucaipa Valley Water District (YVWD) and the City of Banning pump water from this storage unit as well as private users (SGPWA, 2008). The City operates 5 wells in the Beaumont Storage Unit (Wells C2, C3, C4, M3 and M7) with a combined capacity of 4,650 gpm. The City also co-owns three production wells (Wells 24, 25 and 26) with the BCVWD. The total capacity of these three wells is 6,000 gpm, of which the City is allotted half, for a total combined capacity of 7,650 gpm.

Pursuant to the Beaumont Basin Judgment (Superior Court of the State of California for the County of Riverside, 2004 – See Exhibit C in Appendix G), the City has the right to pump 5,910 acre-ft annually until the year 2014 at which time the Beaumont Basin Watermaster shall re-evaluate the safe yield of the basin. The allotted 5,910 acre-ft/yr pumping rights to the City of Banning is comprised of:

1) 882 acre-ft/yr which is 31.43% of the remainder of the Beaumont Basin safe yield (8,650 acre-ft/yr) which is an initial estimate of appropriative rights (see Column 4 of Exhibit C of the Judgment) after appropriations by overlying producers (5,845 acre-ft/yr) and,

2) 5,029 acre-ft/yr which is 31.43% of the controlled overdraft/temporary surplus or annual operating yield of 16,000 acre-ft/yr for a total of 160,000 acre-ft over the ten year period of 2004 to 2014.

If the overlying producers increase or reduce production in the future, or if water districts provide direct service to the appropriators within their service areas, then the City's 882 acre-ft/yr will change. In the Sixth Annual Report of the Beaumont Basin Watermaster, dated April 2010, it was reported that less water has been extracted from the basin than anticipated. In addition, the Beaumont Basin Watermaster Biennial Engineer's Report – July 2003 through June 2008, states that the estimated safe yield of the basin may be approximately 10,290 acre-ft/yr[4] rather than the 8,650 acre-ft/yr, which was stipulated as the initial estimate in the Judgment for the first 10-year period. However, a change in the safe yield for Beaumont Storage Unit can only occur after re-evaluation of the basin by the Watermaster scheduled every 10 years.

Table 5 of the Sixth Annual Beaumont Basin Watermaster Report, 2010 states that the City of Banning has an allocation of unused overlying water of 1,405, 1,645, 1,659, 1,618, 1,830, and 1,805 acre-ft for the years 2008/09, 2009/10, 2010/11, 2011/12, 2012/13, and 2013/14 respectively. These values are derived from 31.43% of the actual amount produced by the overlying producers from the period 2003/04 to 2007/08 (5 years) and applied at the beginning of the subsequent 5-year period. The following table provides an estimate of the projected volume of the City of Banning's ground water in storage within the Beaumont Basin which is their estimated production right.

[4] Page 4-4, Biennial Engineers Report – July 2003 through June 2008, Beaumont Basin Watermaster.

Table 4-4 - The City of Banning's Ground Water in Storage within the Beaumont Basin (Production Right) [acre-ft]

Year	Appropriative Rights After Overlying Producers[1]	Controlled Overdraft of Annual Operating Yield[2]	Recharge of SWP[3]	Banning Production from Beaumont Storage Unit[4]	Transfers Among Appropriators[5]	Estimated Total Water in Storage[6] (Production Right)
2004	0	5,029	0	3,605		1,424
2005	0	5,029	0	1,879		4,575
2006	0	5,029	0	2,012	1,500	9,092
2007	0	5,029	0	2,962		11,159
2008	0	5,029	0	3,417		12,771
2009	1,492*	5,029	1,200	2,355		18,138
2010	1,645	5,029	1,200	1,372		24,640
2011	1,659	5,029	1,298	2,514		30,111
2012	1,618	5,029	1,298	2,514		35,541
2013	1,830	5,029	1,298	2,514		41,184
2014	1,805	0	2,595	2,514		43,069
2015	1,805	0	2,595	2,514		44,955
2016	1,805	0	2,595	2,514		46,841
2017	1,805	0	2,595	2,514		48,726
2018	1,805	0	2,595	2,514		50,612
2019	1,805	0	2,595	2,514		52,498
2020	1,635	0	2,595	2,514		54,214
2021	1,613	0	2,595	2,514		55,907
2022	1,591	0	2,595	2,514		57,579
2023	1,569	0	2,595	2,514		59,229
2024	1,547	0	2,595	2,514		60,856
2025	1,478	0	2,595	2,514		62,415
2026	1,456	0	2,595	2,514		63,952
2027	1,434	0	2,595	2,514		65,466
2028	1,411	0	2,595	2,514		66,958
2029	1,389	0	2,595	2,514		68,428
2030	1,328	0	2,595	2,514		69,837
2031	1,306	0	2,595	2,514		71,223
2032	1,284	0	2,595	2,514		72,588
2033	1,262	0	2,595	2,514		73,931
2034	1,240	0	2,595	2,514		75,251
2035	1,194	0	2,595	2,514		76,526

Notes from Table 4-4:
*It should be noted that there is a discrepancy between the reported City of Banning unused overlying water right allocation in 2009 as reported by the Sixth Annual Beaumont Basin Watermaster Report (1,405 acre-ft) and the value of 1,492 acre-ft as listed in the Draft Beaumont Management Zone Maximum Benefits Program Modeling Scenarios, 2011 Appendix A-3.
[1] Projected allocation of pumping rights per Appendix A-3 ("Projected Allocation of Pumping Rights for the 2004 Beaumont Basin Judgment") of the Draft Beaumont Management Zone Maximum Benefits Program Modeling Scenarios, prepared by Wildemuth Environmental, Inc. dated March 18, 2011.
[2] Controlled overdraft assigned by the Beaumont Basin Judgment for the ten year period 2004 through 2012 (see Appendix G).
[3] State Water Project purchases reported by Watermaster for 2009 year. Values for purchases for 2010 year provided by the City of Banning. Projected Purchases (2011-2035) assumed to be 25% of annual delivery to SGPWA anticipated by the SWP Reliability Report (60% of the maximum annual delivery of 8,650 acre-ft per year until 2013, when EBXII is assumed be online, SGPWA full Table A entitlement of 17,300 will be accessible).
[4] City of Banning production as reported by the City of Banning for years 2004-2010, production includes water received from BCVWD. For years 2011 through 2020, City of Banning pumping is assumed at the average annual pumping value of 2,514 acre-ft/yr.
[5] Transfer reported by Watermaster in the Sixth Annual Report of the Beaumont Basin Watermaster dated 2010, by the City from South Mesa Mutual Water Company.
[6] Sum of columns 1, 2, 3 and 5 minus column 4, the product is added to the previous year Estimated Total Water in Storage. It should be noted that water in storage values differ from that of the 6th Annual Watermaster report due to fiscal vs. calander yeah reporting (i.e. 2009 values in the 6th Annual Report are as of September 30th 2009 and 2009 values shown in this table are as of December 31, 2009).

For the purposes of providing projected water supplies from the Beaumont Basin, it is anticipated that the City will extract an average of 2,514 acre-ft/yr, (average City production since adjudication in 2004, including water received from BCVWD, as reported by the City of Banning, 2011). However, as demand increases, additional water will be extracted as needed from the Beaumont Storage Unit to meet demand.

Watermaster is required by law[5] to re-determine the safe-yield of the Beaumont basin at least every 10 years beginning 10 years after the date of the entry of the Judgment (2004) or at the year 2014. Pursuant to the Judgment, the City is allowed to pump sufficient water from the Beaumont Basin in order to meet its water demand. Should this amount exceed the City's rights, the Beaumont Basin Watermaster has an obligation to replenish the overproduction.

[5] Beaumont Basin Judgment, VI Administration (5)(Y)

4.2.4 Banning Storage Unit

The Banning Storage Unit lies south of the Banning Bench Storage Unit and east of the Beaumont Storage Unit (see Figure 4-2). The total surface area is approximately 2,489 acres or 3.9 sq. miles. The area is underlain by alluvial sediments, with bedrock occurring to the north in the San Bernardino Mountains. The City of Banning currently operates four active production wells within the Banning Storage Unit, Wells M10, M11, M12 and C-5. The City of Banning reported a total combined capacity of 3,500 gpm for the above mentioned wells (Banning, 2010).

The safe yield of the Banning Storage Unit was estimated to be 1,130 acre-ft/yr (Geoscience, 2011) as shown in Table 4-1.

4.2.5 Banning Bench Storage Unit

The Banning Bench Storage Unit is located to the north of the Banning Storage Unit (see Figure 4-2). The total surface area of the storage unit is approximately 3,753 acres or 5.9 sq. miles. The City of Banning currently operates three production wells within the Banning Bench, Wells 1, 2 and 3 with a total capacity of 3,650 gpm (Banning, 2010).

The safe yield of the Banning Bench Storage Unit was estimated to be 1,960 acre-ft/yr (Geoscience, 2011) as shown in Table 4-1.

4.2.6 Banning Canyon Storage Unit

The Banning Canyon Storage Unit is located to the north of the Banning Bench Storage Unit (see Figure 4-2). The total surface area of the Storage Unit is approximately 1,058 acres or 1.7 sq. miles. The primary surface water drainage feature within this storage unit is the San Gorgonio River. The canyon bottom comprises alluvium and the canyon sides are bedrock. The City currently operates 8 active production wells with a total capacity of approximately 8,600 gpm. Most of the City of Banning's ground water is produced from the aquifer within this storage unit.

Additional recharge occurs through the operation of diversion of surface water from the upper reaches of the Whitewater River Drainage into Banning Canyon (Banning Canyon Storage Unit), which was initiated in 1913. The diverted water flows along steep mountain slopes for approximately 14 miles in a mostly concrete lined conveyance system known as The Flume. Banning Heights Mutual Water Company utilizes approximately 1,000 acre-ft/year of Whitewater River diversions, the remainder of the diverted water flows into the San Gorgonio River below the Banning Heights Mutual Water Company extraction point. A portion of the natural runoff and the Whitewater River diversions are diverted into spreading ponds located approximately 1 mile north of the Banning Bench to enhance percolation.
The safe yield of the Banning Canyon Storage Unit was estimated to be 4,070 acre-ft/yr (Geoscience, 2011) as shown in Table 4-1.

4.2.7 Cabazon Storage Unit

The Cabazon Storage Unit encompasses approximately 26.9 square miles or 17,215 acres. The Cabazon Storage Unit is located near the eastern boundary of the City, southeast of the Banning and Banning Bench Storage Units. Ground water extraction is the result of production from the City of Banning Well C6, Cabazon Water District, Mission Springs Water District as well as private producers. Since Well C-6 came online in 2004 it has averaged approximately 710 acre-ft/yr with maximum extraction occurring in 2007 at approximately 1,202 acre-ft. The total design capacity for this well is 900 gpm.

Additional ground water can be developed from the Cabazon Storage Unit. A water balance prepared for the Cabazon Storage Unit, as described in the GEOSCIENCE 2011 report, determined that a positive change in storage has occurred as a result of inflow and outflow factors including wastewater percolated into the Cabazon Storage Unit. Therefore, future projections of additional water from the Cabazon Storage Unit available to the City assume all inflow and outflow values remain the same, with the exception of wastewater applied to the basin. For purposes of projecting Cabazon water supplies into the future, inflow of recycled water increases in time to account for the increase of wastewater generated by an increase population over time, this recycled water will be percolated into the Cabazon

Storage Unit. However, once Phase I of the WWTP expansion is completed, 1,680 acre-ft/yr will be used for irrigation purposes and will no longer be applied to the Cabazon Storage Unit as direct percolation.

Projected future wastewater volumes were estimated using a population growth of 2% per year as shown in Table 2-3. The average wastewater per capita for the period 2005-2010 was estimated to be 84.5 gallons per capita per day (gpcd). Therefore, the volume of projected wastewater was estimated by multiplying the population by 84.5 gal/day. However, with the onset of water conservation measures previously implemented and future conservation to accomplish the 20X2020 targets, it is anticipated that decreasing wastewater volumes will be generated[6]. It estimated that due to conservation, wastewater flows will decrease from 82 gpcd in 2015 to 71 gpcd by 2035. The anticipated volume of wastewater generated using the per capita wastewater generation with conservation was calculated. To determine the volume of treated wastewater that will be percolated into the Cabazon Storage Unit, the volume of wastewater generated from Phase I completion (1,680 acre-ft/yr) was deducted from the future wastewater generation estimates after 2014 (when completion of Phase I is expected to occur). The remainder of treated wastewater will be applied to the Cabazon Storage Unit in the form of percolation and was incorporated in the hydrologic budget to estimate the anticipated future change in storage in the Cabazon Storage Unit using the method and inflow and outflow parameters as described in the GEOSCIENCE 2011 report. The volume of ground water, represented by the change in storage, is assumed to be additional water available to the City for development. The projected change in storage in addition to the City's average production of 710 acre-ft/yr (from Well C-6) was used to determine available future supplies to the City from the Cabazon Storage Unit. Total supplies available to the City from the Cabazon Storage Unit are shown in Table 4-1.

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[6] The potential reduction in wastewater flows due to the increasing impact of water conservation measures was estimates by assuming 40% reduction on water demands on all residential developments to serve *new* population growth and 10% for non-residential. Using wastewater flow estimates form Table 2.6 of the Carollo Engineers 2006 Sewering System Study and land use estimates from Table 3-2 of this report it is estimates that 73% of wastewater flows come from residential and 27% of the wastewater flow is projected to come from non-residential sources. The percentage conservation was applied to future projected residential and non-residential water usage to estimate potential future wastewater generation to include the effects of conservation.

4.3 Surface Water

Starting in 1913, surface water from the Whitewater River was diverted into the Banning Canyon Storage Unit. Since 1961, an average of 1,500 acre-ft/yr was diverted into Banning Canyon. The water flowed along a concrete lined conveyance system and through two hydroelectric power plants. Currently, due to damage along sections of the flume, surface flow is diverted into Burnt Canyon to the north, and then back to the Flume upstream of Powerhouse No. 1 where it continues downstream through Powerhouse No. 2 to the reservoir operated by Banning Heights Mutual Water Company, where approximately 1,000 acre-ft/yr is extracted. The remaining water flowed into the San Gorgonio River, where it recharged the Banning Canyon Storage Unit.

The City of Banning plans to conserve natural and urban stormwater flows from tributary creeks within its service area by allowing water to percolate into the ground. However, only the Butterfield Specific Plan includes design parameters to capture and recharge approximately 1,370 acre-ft/yr of stormwater flow from Smith Creek by the year 2020.

A preliminary evaluation by the City indicates that a portion of stormwater flows from creeks in the City of Banning water resource area could be conserved as “new” water to meet future needs.

4.4 Transfer or Exchange Opportunities

Currently, the City of Banning has no plans for water transfers or exchanges with the exception of inter-basin transfers in the Beaumont Storage Unit. The City believes it can meet its future water demand with existing sources, conservation, recycled water, and SWP water.

4.5 Desalinated Water

The City of Banning is located approximately 55 miles from the ocean and 50 miles from the Salton Sea. As such, the City has no plans for desalination projects. In addition, water quality in the ground water storage units is very good, and therefore there are no areas of high TDS water that require desalting.

4.6 Recycled Water Supply

The City of Banning Wastewater Treatment Plant, located in the southeast section of the City, has the capacity to treat 3.6 mgd of wastewater to secondary standards. The average flow treated by the plant from 2005 to 2010 is approximately 2.4 mgd. The headworks, completed in 1999, was designed for an ultimate capacity of 7.8 mgd. The current treatment process includes screening, grit removal, primary clarification, trickling filters, and secondary clarifiers. Anaerobic digesters and sludge drying beds are used for sludge stabilization and dewatering. Treated effluent water is discharged to percolation ponds and subsequently recharges the Cabazon Storage Unit. *The City of Banning Annual Operations Report for January 1st, 2010 Through December 31st, 2010* states that the WWTP received on average, 2.2 mgd for 2010. Table 4-5 shows the volume of wastewater received and treated at the WWTP.

Table 4-5
Treated Wastewater to Secondary Standards

	2005	2006	2007	2008	2009	2010
[million gallons]	969	963	892	860	802	807
[acre-ft]	2,974	2,956	2,737	2,639	2,461	2,477

Sewer services are provided to the entire city limits and to the unincorporated areas of Riverside County that surround the southeast section of the City. Collected wastewater is transported by sewer main lines that are 8, 10, 15, and 18 inches in diameter, which are connected to trunk lines. The trunk lines, ranging from 24 to 30 inches in diameter, convey wastewater to the plant. Treated effluent is then discharged to percolation ponds and subsequently recharges the Cabazon Storage Unit.

The City is developing a program to substitute recycled water for existing potable water demand used for irrigation. Currently the WWTP is unable to use the recycled water for irrigation purposes as the secondary water currently produced by the WWTP does not meet the State of California Department of Health Services (CDHS) Title 22 water quality requirements.

4.6.1 Potential for Recycled Water Use

The City of Banning proposes to expand its 3.6 million gallons per day (mgd) wastewater treatment plant and construct facilities to support its planned recycled water storage and distribution capability in accordance with the Banning Recycled Water Master Plan. Phase I consists of increasing the capacity of the existing WWTP from 3.6 mgd to 5.1 mgd. The additional 1.5 mgd (1,680 acre-ft/yr) capacity would include an advanced treatment process using a Membrane Bioreactor (MBR) to produce recycled water. The MBR treatment process would satisfy DHS Title 22 water quality requirements without filtration. Well R-1, located east of the WWTP, would be used to extract ground water to use in the treatment process. Recycled water would be used for irrigation of parks, golf courses, street medians and greenbelts in the Phase I service area. Recycled water supplies are shown in Table 4-1.

Following Phase I completion 1,680 acre-ft/yr will be available to supplement potable water demand for irrigation purposes. It is anticipated that the city may increase supply by an additional 1.5 mgd/ 1,680 acre-ft/yr every ten years.

If the City were to expand the WWTP every ten years by 1.5 mgd or 1,680 acre-ft/yr, recycled water production could exceed demand by approximately 882 acre-ft/yr by the year 2035 and may be used in other beneficial ways.

4.6.2 Recycled Water Opportunities

There is considerable potential for the use of recycled water in the City of Banning. The City has plans to use recycled water for the irrigation of golf courses, parks, medians, greenbelts and groundwater recharge. Water not used to offset potable demand will be applied to percolation basins for ground water recharge in the Cabazon Storage Unit.

The City of Banning Recycled Water Master Plan, 2006, identified potential potable water customers who could convert to recycled water, as well as future developments which could utilize recycled water to offset future potable water demands. The Master Plan prioritized 18 existing and future recycled water users based on various parameters such as demand, distance to backbone system and cost. The Master Plan grouped these potential recycled water users into Phase I and Phase II demands (a copy of the Recycled Water Master Plan is provided in Appendix H). The *City of Banning Initial Study/Mitigated Negative Declaration Wastewater Treatment Plant Expansion and Phase I Recycled Water System, 2008 (MND, 2008)* estimated demand will increase from 2,663 acre-ft/yr after completion of Phase I to 5,713 acre-ft/yr at buildout. The date of final buildout is unknown; however the City's General Plan estimates the population to be 80,226 at buildout. If the population were to continue to grow at the rate projected by City of Banning 2008 Draft Housing Element Update for years 2008-2014 forecasts (projecting a rate of 2% after the year 2010), this population wouldn't occur until 2061.

Table 4-6 shows projected recycled water demand assuming that estimates for Phase I demands are current demands as described in the Recycled Water Master Plan, buildout occurs in 2061, and that a linear relationship exists.

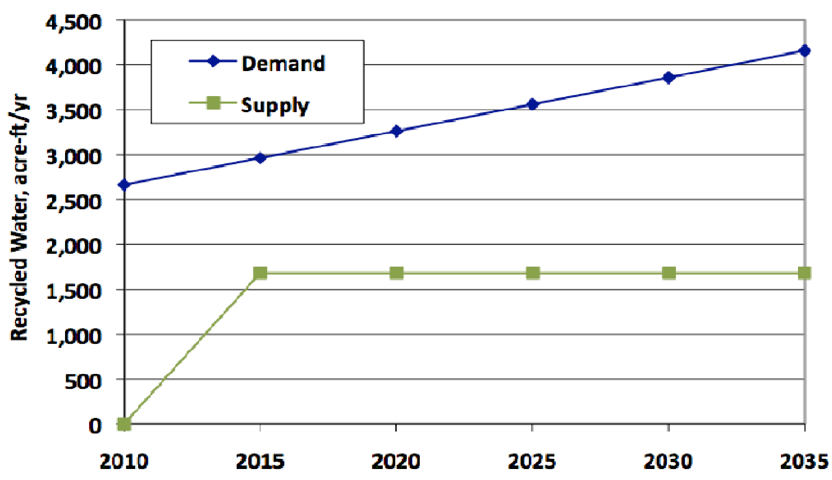
Table 4-6
Recycled Water Demand (acre-ft)

	2010	2015	2020	2025	2030	2035
Recycled Water Demand[1]	2,663	2,962	3,261	3,560	3,859	4,158
Recycled Water Supply[2]	0	1,680	1,680	1,680	1,680	1,680
Difference[3]	**2,663**	**1,282**	**1,581**	**1,880**	**2,179**	**2,478**

[1] Demand assumes current demand is 2,663 acre-ft as described in the Recycled Water Master Plan, buildout occurs in 2061, and that a linear relationship exists.
[2] Supply assumes Phase I completion of the WWTP will be completed in 2014 and 1.5 MGD or 1,680 acre-ft/yr will be treated to tertiary standards.
[3] Difference is assumed to be made up with potable water.

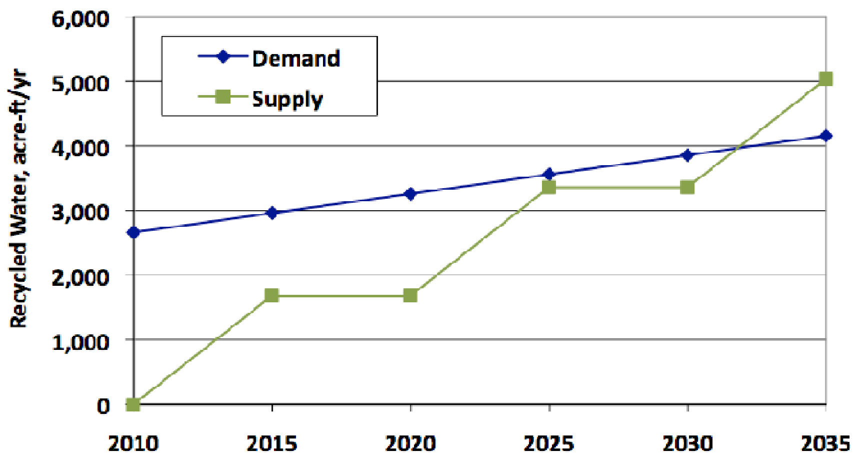
Figure 4-4 compares recycled water supply (as estimated and discussed in Section 4.1) verses demand. If the City decides to continue expansion of the WWTP supply could exceed demand in 2035 by approximately 882 acre-ft/yr, as shown in Figure 4-5. Recycled water produced in excess of demand will be returned to the Cabazon or Banning Storage Unit via percolation ponds near the WWTP.

Figure 4-4
Recycled Water Supply vs. Demand Projections



Note: Recycled water supply estimated and discussed in Section 4.1

Figure 4-5
Recycled Water Supply vs. Demand Projections
With Incremental Addition of WWTP Capacity



Note: Recycled water supply estimated if City continues expansion by 1.5 mgd every ten years.

The 2005 UWMP estimated recycled water demand to be 1,504 acre-ft for the year 2010, these estimates anticipated that Phase I of the WWTP expansion would be completed by 2010. Currently the City has not completed Phase I of the Treatment Plant, the numbers reflected in this UWMP anticipate that Phase I will be completed by 2014.

4.7 Participation in the Beaumont Basin Maximum Benefits Program

The City of Banning has recently enrolled in the Maximum Benefits Program in the Beaumont Management Zone (BMZ). The City intends to use recycled water produced by their treatment plant located in the Cabazon Storage Unit to substitute a portion of potable water demands in the BMZ. As a participant in the BMZ program the City will be allowed to discharge recycled water of higher Total Dissolved Solids (TDS) (approximately 350 mg/L) with the commitment to participate in actions to reduce the total dissolved solids concentrations at the wastewater treatment plant. Construction of desalters, additional purchase of SWP water in the non-potable system, or stormwater capture for mixing can aide in reducing overall TDS concentrations in the Basin. The BMZ program is administered by the Santa Ana Regional Water Quality Control Board. The City is actively monitoring the water quality of the effluent discharges to the percolation ponds at the WWTP will meet the Basin Management Plan objective of 330 mg/L through ongoing recharge of SWP purchased water for ground water storage, or in the future by expanding water quality treatment processes to reduce TDS. The effluent water quality will be closely monitored to comply with the Maximum Benefits Program.

4.7.1 Economic Feasibility

The Mitigated Negative Declaration (MND), 2008 prepared by the City of Banning, states that as of May 2008 the City of Banning will be submitting an application for a State Revolving Fund (SRF) loan to the State Water Resources Control Board. The SRF Loan Program is partially funded by the U.S. Environmental Protection Agency (USEPA) and subject to federal environmental regulations including the Endangered Species Act (ESA), the National Historic Preservation Act (NHPA) and the General Conformity Rule for the Clean Air Act (CAA). The USEPA has chosen to use the California Environmental Quality Act (CEQA) as the compliance base for California's SRF Loan Program, in addition to compliance with the ESA, NHPA and CAA. Collectively, the State Water Resources Control Board calls these requirements CEQA-Plus.

The MND also states that the State Water Resources Control Board, Division of Financial Assistance, is a Responsible Agency that will act on behalf of the USEPA to review and consider the CEQA document before approving the project's funding. The Board will make a determination as to the adequacy of the CEQA document and seek concurrence from federal agencies on compliance with federal crosscutting regulations. The CEQA document is also transmitted to the State Clearinghouse for State agency review before the State Water Resources Control Board begins consultation with federal agencies for concurrence (MND, 2008).

Additional environmental analyses are required for federal compliance associated with the CEQA-Plus process for the SRF loan application for the proposed Banning wastewater treatment plant expansion and Phase I recycling water system: Endangered Species Act; General Conformity Rule of the Clean Air Act; National Historic Preservation Act; Sections 401 and 404 of the Clean Water Act (Wetland Protection); Coastal Zone Management Act; Farmland Protection Policy Act; Floodplain Management; and, Wild and Scenic Rivers Act. The environmental analyses for applicable federal consultation processes are underway and will be included in the CEQA-Plus documentation that will accompany the SRF loan application (MND, 2008).

4.7.2 Incentives for Recycled Water Use

The City's Water Shortage Contingency Plan has exceptions from water conservation measures for consumers, such as golf courses, commercial nurseries, and car wash facilities, who use recycled water. The City can encourage recycled water use by restructuring its water rates and service charges for customers that use recycled water, however recycled water use will still be limited to those customers who are within a close proximity to a recycled water pipeline.

4.8 Return Flow Supply

Water applied for irrigation typically exceeds the evapotranspiration requirements of the plant. Water that isn't utilized by the plants will percolate to the groundwater and be available for future use. This volume of water is known as return flow. In Table 4-1 return flows from irrigation were calculated from current and projected demands based on new developments within the Banning Storage Units. Return flows are only considered for developments projected for construction which will add new recharge to the storage units, as current irrigation is already accounted for in the Safe Yield Values for each storage unit. New Developments include the Loma Linda Specific Plan of 944 dwelling units and 100 of the 303 dwelling units for the Fiesta Development, the reduced number of dwelling units is an estimate of Five Bridges dwelling units which are located within the Banning Storage unit. Return flow to the Beaumont Storage Unit is not accounted for as it is included in the Adjudication, which states that all return flows are dedicated for overdraft mitigation. It is assumed that 50% of water used for residential purposes will be used for outdoor irrigation purposes, and 25% of this water will return to the aquifer system as return flows. Any irrigation occurring in the industrial, commercial, or public sector could not be quantified and was not included from these sources as a portion of future supply as return flow.

4.9 State Water Project Water

The San Gorgonio Pass Water Agency (SGPWA) began importing State Water Project (SWP) water in 2003 and has a contract with the DWR for 17,300 acre-ft/yr of SWP water from Silverwood Reservoir via the Devil's Canyon Power Plant. With the completion of Phase I of the East Branch Extension Project in 2004, SGPWA was able to begin utilizing half of its allocation, approximately 8,650 acre-ft/yr.

The City of Banning is eligible to receive imported water from the SGPWA. Other eligible major water purveyors include BCVWD, SMWC, YVWD, and Cabazon Water District. However, historically, only YVWD, BCVWD, and the City of Banning purchased SWP water from SGPWA. YVWD, BCVWD and City of Banning have purchased 4%, 45%, and 25% respectively of SWP water delivered to SGPWA between 2005 and 2010.

The SGPWA's entitlement of SWP water is not guaranteed every year. Climatic variability, the availability of diversion, storage and conveyance facilities, environmental concerns, and increasing demand for SWP water affect the reliability of SWP delivery. The SGPWA Report on Water Conditions in 2008 stated that the 2006 allocation was 100%, which was the last wet year, however the allocation in 2007, 2008 and 2009 was 60% 35% and 40% respectively of contract entitlement.

The State Water Project Delivery Reliability Report (DWR, 2009) estimates that long-term average reliability of SWP deliveries to the SGPWA for all hydrologic conditions (long-term average, wet and dry year conditions) to be 64% in 2009 and 60% in 2029. For conservative estimates, 60% of Table A[7] entitlement is estimated to be made available to the SGPWA. The City began purchasing SWP water in

[7] Table A is used to define the contractor's portion of the available water supply and does not guarantee the maximum amount is annually met as deliveries are subject to annual reevaluations of available supply based on conditions.

2008 from the SGPWA for groundwater recharge in the Noble Creek Recharge Ponds located in the Beaumont Storage Unit. The SGPWA currently does not commit a percentage of received SWP water to its retailers. However, since 2008, the City has annually purchased SWP water from the SGPWA. The City intends to purchase, on average, 25% of Table A deliveries from the SGPWA for recharge to ground water storage of the Beaumont Basin. The City has a total of 80,000 acre-ft of storage available in Beaumont Basin. The SGPWA is able to receive 8,650 acre-ft/yr with the completion of Phase I of the East Branch Extension in 2004, and will be able to receive the full entitlement of 17,300 acre-ft upon completion of Phase II. For projection purposes of SWP water available to the City, 25% of 8,650 acre-ft, or 1,298 acre-ft/yr is estimated for years 2011 to 2014, and 25% of 17,300 acre-ft or 2,514 acre-ft/yr is estimated to be available after 2014. The City purchased 1,200 acre-ft of SWP water in 2010. Projected SWP water supplies available to the City of Banning are shown in Table 4-1.

The 2005 UWMP stated that anticipated additional water would be purchased from DWR or other entities in Central and/or Northern California, however at this time there is no plan to receive additional water from other SWP sources (personal communication with the Director of Public Works, City of Banning, Duane Burk, 2011).

The SGPWA is currently working in cooperation with the San Bernardino Valley Municipal Water District and the California Department of Water Resources Division of Engineering to construct the second phase of the East Branch Extension Project. Phase II construction of the East Branch includes additional water transmission facilities as well as allow utilization of the full 17,300 acre-ft/yr allotment of SWP water. The California DWR certified the Environmental Impact Report and approved the project on March 6, 2009. Construction of the proposed project is scheduled to begin in 2009 and be complete in 2013[8]. SGPWA plans to use the imported water to recharge the Beaumont Storage Unit via the Noble Creek Spreading Grounds in Cherry Valley. The SGPWA Draft 2010 UWMP states that in order to accommodate the full allotment of SWP water generated by the completion of Phase II of the East

[8] Per California Department of Water Resources "Findings of Fact and Statement of Overriding Consideration" March 6, 2009, completion is in 2012, although per the Supplemental Water Supply Planning Study (Webb, 2009), completion is scheduled in 2013. Recent estimates by SGPWA indicate that EBXII may be online in 2014.

Branch Extension, new spreading basins similar to the existing Noble Creek Spreading Grounds are planned to be on-line by 2013, referred to as Brookside South Project.

Projected reliability in the 2009 DWR Reliability Report shows a decrease in the long-term average reliability of water supplies from the SWP when compared to the previous 2007 report. Reliability estimates in the 2009 report are reduced by the operational restrictions of the biological opinions issued by the U.S. Fish and Wildlife Service in December 2008 and the National Marine Fisheries Service in June 2009 governing the SWP and Central Valley Project operations. In addition to reducing supplies to protect the Delta Wildlife, potential effects from climate change are also incorporated in the Reliability Report for 2009. The amount of SWP water purchased will increase as supplies allow. However, the City will continue to store and use water available from the SWP, but continues to strive to reduce its reliance on SWP water through stormwater capture, both native and urban runoff, maximizing the use of recycled water generated within the City, and ongoing conservation programs.

5.0 WATER SUPPLY RELIABILITY AND WATER SHORTAGE CONTINGENCY PLANNING

Law 10620: *(f) An urban water supplier shall describe in the plan water management tools and options used by that entity that will maximize resources and minimize the need to import water from other regions.*

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

(c)(1) Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage, to the extent practicable, and provide data for each of the following:

1) An average water year.
2) A single-dry water year.
3) Multiple-dry water years.

(2) For any water source that may not be available at a consistent level of use, given specific legal, environmental, water quality, or climatic factors, describe plans to supplement or replace that source with alternative sources or water demand management measures, to the extent practicable.

Law 10631: *(c) Actions to be undertaken by the urban water supplier to prepare for, and implement during, a catastrophic interruption of water supplies including, but not limited to, a regional power outage, an earthquake, or other disaster.*

(d) Additional, mandatory prohibitions against specific water use practices during water shortages, including, but not limited to, prohibiting the use of potable water for street cleaning.

(e) Consumption reduction methods in the most restrictive stages. Each urban water supplier may use any type of consumption reduction methods in its water shortage contingency analysis that would reduce water use, are appropriate for its area, and have the ability to achieve a water use reduction consistent with up to a 50 percent reduction in water supply.

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

(g) An analysis of the impacts of each of the actions and conditions described in subdivisions (a) to (f), inclusive, on the revenues and expenditures of the urban water supplier, and proposed measures to overcome those impacts, such as the development of reserves and rate adjustments.

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

Law 10632 *(a) Stages of action to be undertaken by the urban water supplier in response to water supply shortages, including up to a 50 percent reduction in water supply, and an outline of specific water supply conditions which are applicable to each stage.*

(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.

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

Law 10634: *The plan shall include information, to the extent practicable, relating to the quality of existing sources of water available to the supplier over the same five-year increments as described in subdivision (a) of Section 10631, and the manner in which water quality affects water management strategies and supply reliability.*

Law 10635 *(a) Every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple-dry water years. This water supply and demand assessment shall compare the total water supply sources available to the water supplier with the total projected water use over the next 20 years, in five-year increments, for a normal water year, a single-dry water year, and multiple-dry water years. The water service reliability assessment shall be based upon the information compiled pursuant to Section 10631, including available data from state, regional, or local agency population projections within the service area of the urban water supplier.*

Currently, the City relies on groundwater and imported SWP water to meet their water demand. Groundwater production is generally maintained at a level within the perennial yield of the groundwater basins as estimated by Geoscience (2011). The amount of groundwater in storage within the City of Banning area (excluding the Beaumont Storage Unit) is estimated to be between 1.1 and 1.2 million acre-ft (GEOSCIENCE, 2011). The safe yield value for the Beaumont Storage Unit was estimated in the 2004 Judgment to be 8,650 acre-ft/yr, of which, the City is entitled to 5,910 acre-ft/yr until 2014, however, since adjudication in 2004 the City has only produced an average of 2,514 acre-ft/yr, water not produced from the basin remains in storage, (see Table 4-4) to be utilized in the future when needed. During dry years or emergency situations the City has the ability to produce water from ground water in storage beyond the perennial yield of the ground water basins.

5.1 Water Supply Reliability

To accurately determine the water supply availability during average water years and critical dry years, three precipitation stations were used (the spatial distribution of the storage units spans a wide range of elevation zones and precipitation trends) to analyze precipitation and establish dry and multiple-dry year events (see Table 2-2 for precipitation values and period of records). In addition, due to a lack of production data within Banning and Cabazon Storage Units that correlate with precipitation records (see Table 4-3 for production records), only the period for which production and precipitation records were both available were used in this analysis. For example, the driest year on record at the Cabazon Station was 2002, however production records for the Cabazon Storage Unit (Well C-6 – see Table 4-3 for production records) do not begin until 2004, so the driest period for which production data was available for the Cabazon Storage Unit was 2007 (see Table 5-1).

Historical production records indicate that the Banning Canyon, Beaumont, and Cabazon Storage Units to have shown no production limitations to the City's supply wells during dry years. However, available data demonstrated that production in Banning and Banning Bench Storage Units is limited during dry and multiple-dry year events. The average production during single and multiple-dry years was used to determine water supplies for the Banning and Banning Bench Storage Units. Table 5-1 summarizes the average year, single-dry year and multiple-dry years used to determine water supply estimates for each storage unit using the above mentioned criteria.

Table 5-1 – Production and Precipitation Data Availability Used to Determine Dry Year Water Supplies

Storage Unit	Period of Record			Precipitation Station Used in Analysis
	Average Year/ Production Record Availability	Single-Dry Year	Multiple-Dry Years	
Banning	1992-2009	2002	2000-2002	Cabazon Station 025
Banning Bench and Banning Canyon	1959-2009	2002	2000-2002	Banning Bench Station 011
Beaumont	1959-2009	1999	1988-1990	Beaumont Station 013
Cabazon	2004-2009	2007	2006-2009	Cabazon Station 025

Water is produced from the storage units at a level that meets the City's water demand. In single-dry and multiple-dry water years the City can pump enough water from the storage units to ensure an adequate water supply for its customers. Table 5-2, 5-3 and 5-4 and Figures 5-1, 5-2, and 5-3 show water supplies for each source in an average water year, a single-dry year, and multiple-dry years, respectively to be within or below the maximum perennial yield range, however, these storage units can be operated above their safe yield during dry years by pumping groundwater from storage, in addition, stored water from the Beaumont Basin can be utilized when necessary. When the City completes the modification of the wastewater treatment plant to allow recycled water use for irrigation purposes, the potable demand will decrease, further reassuring that dry year potable supplies will meet the demands of the City.

Recycled water supplies will not diminish significantly in dry water years. Although demand will decrease due to conservation measures, this will mainly affect outdoor water use. Any decrease in indoor water will be negligible and will not significantly decrease recycled water production.

Return flows from irrigation will decrease in dry years due to conservation measures that restrict irrigation during the day. The decrease in return flows is proportionate to the overall decrease in water demand during dry years, which is described in detail in Section 4.8. Studies conducted by the Carlsbad Municipal Water District (2000), have shown that irrigation water demands are about nine percent greater than normal during hot, dry weather. For a single-dry year and multiple-dry year conditions, irrigation demand within new developments, discussed in Section 4.8, will increase nine percent.

The State Water Project Delivery Reliability Report (DWR, 2009) estimates that long-term average reliability of SWP deliveries to the SGPWA for all hydrologic conditions (long-term average, wet and dry year conditions) to be 64% in 2009 and 60% in 2029, for purposes of water supply projections, 60% reliability is assumed as a conservative approach. The SGPWA is able to receive 8,650 acre-ft/yr with the completion of Phase I of the East Branch Extension in 2004, and will be able to receive the full entitlement of 17,300 acre-ft upon completion of Phase II. For projection purposes the City intends to purchase 25% of the water delivered to SGPWA. Based on 60% reliability of SWP delivery, the City will purchase on average 1,298 acre-ft/yr[9] before the construction of EBXII and 2,598 acre-ft/yr after the construction of EBXII in 2014.

SWP water supply will be affected during single-dry and multiple-dry water years. The average amount of Table A water that will be delivered during single-dry and multiple-dry water years was projected for the years 2009 through 2029[10]. The single-most dry water year was 1977. The SWP deliveries during

[9] Delivery to SGPWA at a average reliability of 60% is 5,190 acre-ft/yr (8,650 acre-ft x 60% = 5,190 acre-ft). The City will purchase 25% of 5,190 acre-ft/yr or 1,298 acre-ft/yr on average. After construction of EBXII, the City will purchase 2,598 acre-ft/yr (60% of 17,300 acre-ft =10,380 acre-ft x 25% = 2,595 acre-ft/yr.

[10] Values shown in this UWMP after 2029 repeat 2029 projection volumes.

1977 were used as single-dry year reliability values for SWP water supply projections. For multiple-dry water years, the average SWP delivery during the 3-year drought of 1929-1931 was used for multiple-dry water year SWP water supply projections. Table 5-3 and 5-4 shows that in 2015, for single-dry and multiply-dry years, deliveries are projected to be 7 and 33 percent, respectively of SGPWA's allotment and in 2030 single and multiple-dry years are projected to be 10 and 35 percent, respectively (2030 values were repeated for 2035 estimates). Currently the SGPWA only has the capacity to receive half of it 17,300 acre-ft/yr deliveries as explained in Section 4.9, after the completion of Phase II of the East Branch Extension the SGPWA will be able to receive the full 17,300 acre-ft/yr. Based on historical purchases, the City anticipates that it will be able to purchase a minimum of 25% of SWP deliveries from the SGPWA for storage in the Beaumont Storage Unit.

Table 5-2
Average Water Years Supplies per Water Supply Source
(acre-ft/yr)

Water Supply Source	Average Water Year Supplies[1]					
	2010[2]	2015	2020	2025	2030	2035
Banning Storage Unit	1,218	1,130	1,130	1,130	1,130	1,130
Banning Bench Storage Unit	1,472	1,960	1,960	1,960	1,960	1,960
Banning Canyon Storage Unit	3,726	4,070	4,070	4,070	4,070	4,070
Beaumont Storage Unit	1,372	2,514	2,514	2,514	2,514	2,514
Cabazon Storage Unit	565	1,185	1,405	1,648	1,916	2,212
Recycled Water Supply	0	1,680	1,680	1,680	1,680	1,680
Return Flows from Recycled Water Irrigation	0	420	420	420	420	420
Return Flows Potable Irrigation	0	9	18	28	38	48
SWP Table A Entitlement	1,200	2,595	2,595	2,595	2,595	2,595
Total	**9,552**	**15,563**	**15,792**	**16,045**	**16,323**	**16,628**

[1] Explanation of Average Year supplies are discussed in Section 4.1 and Table 4-1.
[2] 2010 values are actual supplies utilized by the City in 2010. The DWR Guidebook requires inclusion of 2010, however as the deadline for submittal of the UWMP has been extended to 2011, all 2010 values are not projections or estimates, but are actual values.

Figure 5-1
Average Water Years Supplies per Water Supply Source
(acre-ft/yr)

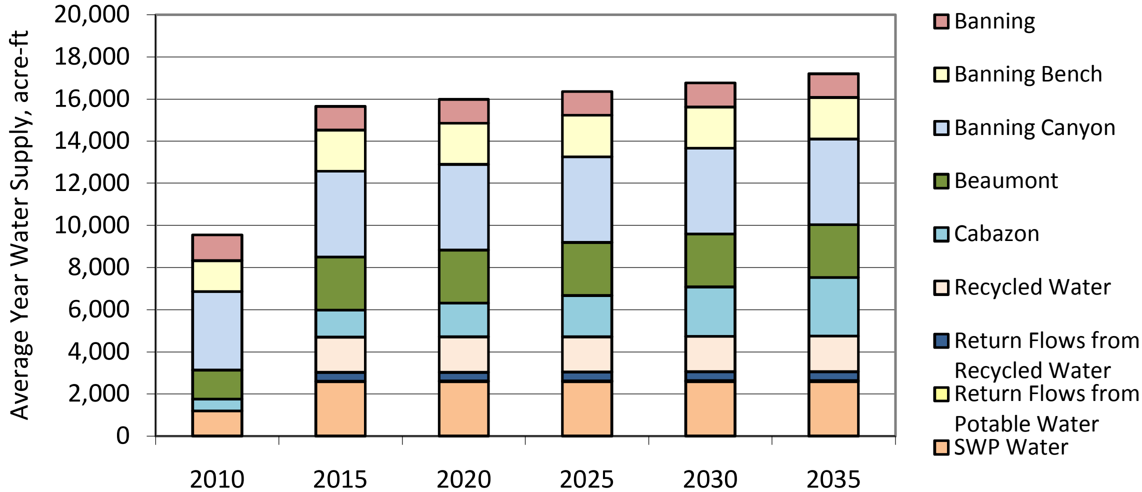


Table 5-3
Single-Dry Water Year Supplies per Water Supply Source
(acre-ft/yr)

Water Supply Source	Single - Dry Water Year Supplies[1] 2010[2]	2015	2020	2025	2030	2035
Banning Storage Unit	N/A	1,103	1,103	1,103	1,103	1,103
Banning Bench Storage Unit	N/A	733	733	733	733	733
Banning Canyon Storage Unit	N/A	4,070	4,070	4,070	4,070	4,070
Beaumont Storage Unit	N/A	2,514	2,514	2,514	2,514	2,514
Cabazon Storage Unit	N/A	1,185	1,405	1,648	1,916	2,212
Recycled Water Supply	N/A	1,680	1,680	1,680	1,680	1,680
Return Flows from Recycled Water Irrigation	N/A	458	458	458	458	458
Return Flows Potable Irrigation	N/A	10	20	30	41	52
SWP Table A Entitlement	N/A	290	331	372	413	413
Total	N/A	**12,043**	**12,314**	**12,608**	**12,928**	**13,235**

[1] Explanation of single-dry year supplies are discussed in Section 5.1.
[2] 2010 values are actual supplies utilized by the City in 2010. The DWR Guidebook requires inclusion of 2010, however as the deadline for submittal of the UWMP has been extended to 2011, all 2010 values are not projections or estimates, but are actual values, and therefore are not estimated in single-dry year supplies.

Figure 5-2
Single-dry Water Year Supplies per Water Supply Source
(acre-ft/yr)

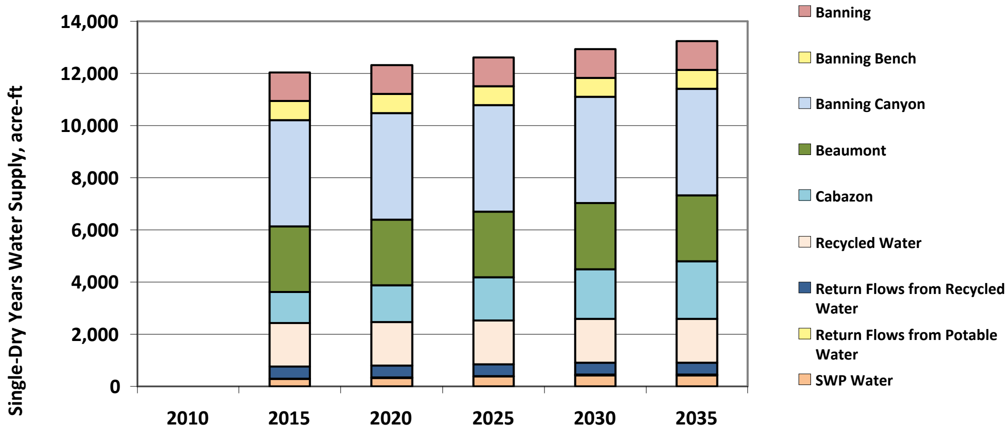
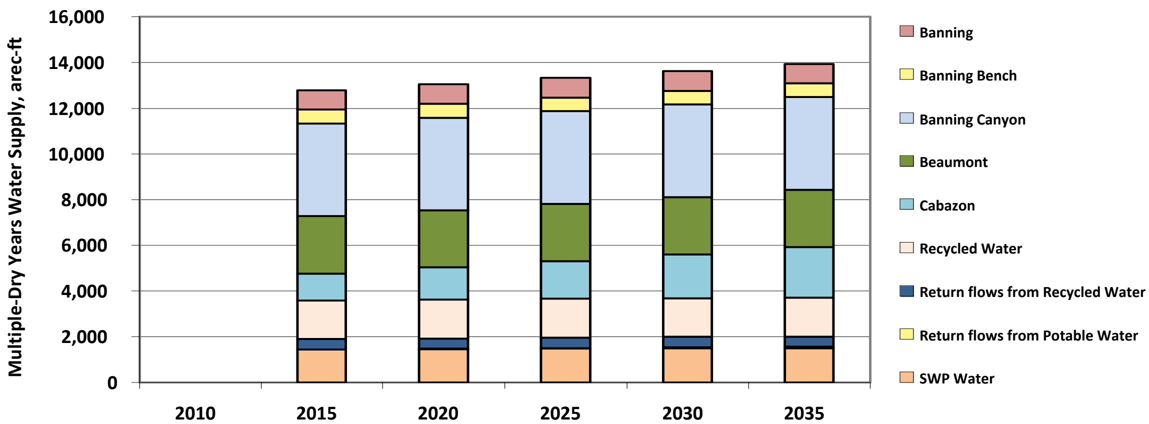


Table 5-4
Multiple-Dry Water Years Supplies per Water Supply Source
(acre-ft/yr)

	Multiple - Dry Water Years Supplies[1]					
Water Supply Source	**2010[2]**	**2015**	**2020**	**2025**	**2030**	**2035**
Banning Storage Unit	N/A	843	843	843	843	843
Banning Bench Storage Unit	N/A	598	598	598	598	598
Banning Canyon Storage Unit	N/A	4,070	4,070	4,070	4,070	4,070
Beaumont Storage Unit	N/A	2,514	2,514	2,514	2,514	2,514
Cabazon Storage Unit	N/A	1,185	1,405	1,648	1,916	2,212
Recycled Water Supply	N/A	1,680	1,680	1,680	1,680	1,680
Return Flows from Recycled Water Irrigation	N/A	458	458	458	458	458
Return Flows Potable Irrigation	N/A	10	20	30	41	52
SWP Table A Entitlement	N/A	1,427	1,451	1,476	1,500	1,500
Total	N/A	**12,784**	**13,038**	**13,316**	**13,619**	**13,926**

[1] Explanation of multiple-dry year supplies are discussed in Section 5.1.
[2] 2010 values are actual supplies utilized by the City in 2010. The DWR Guidebook requires inclusion of 2010, however as the deadline for submittal of the UWMP has been extended to 2011, all 2010 values are not projections or estimates, but are actual values, and therefore are not estimated in multiple-dry year supplies.

Figure 5-3
Multiple-Dry Water Years Supplies per Water Supply Source
(acre-ft/yr)



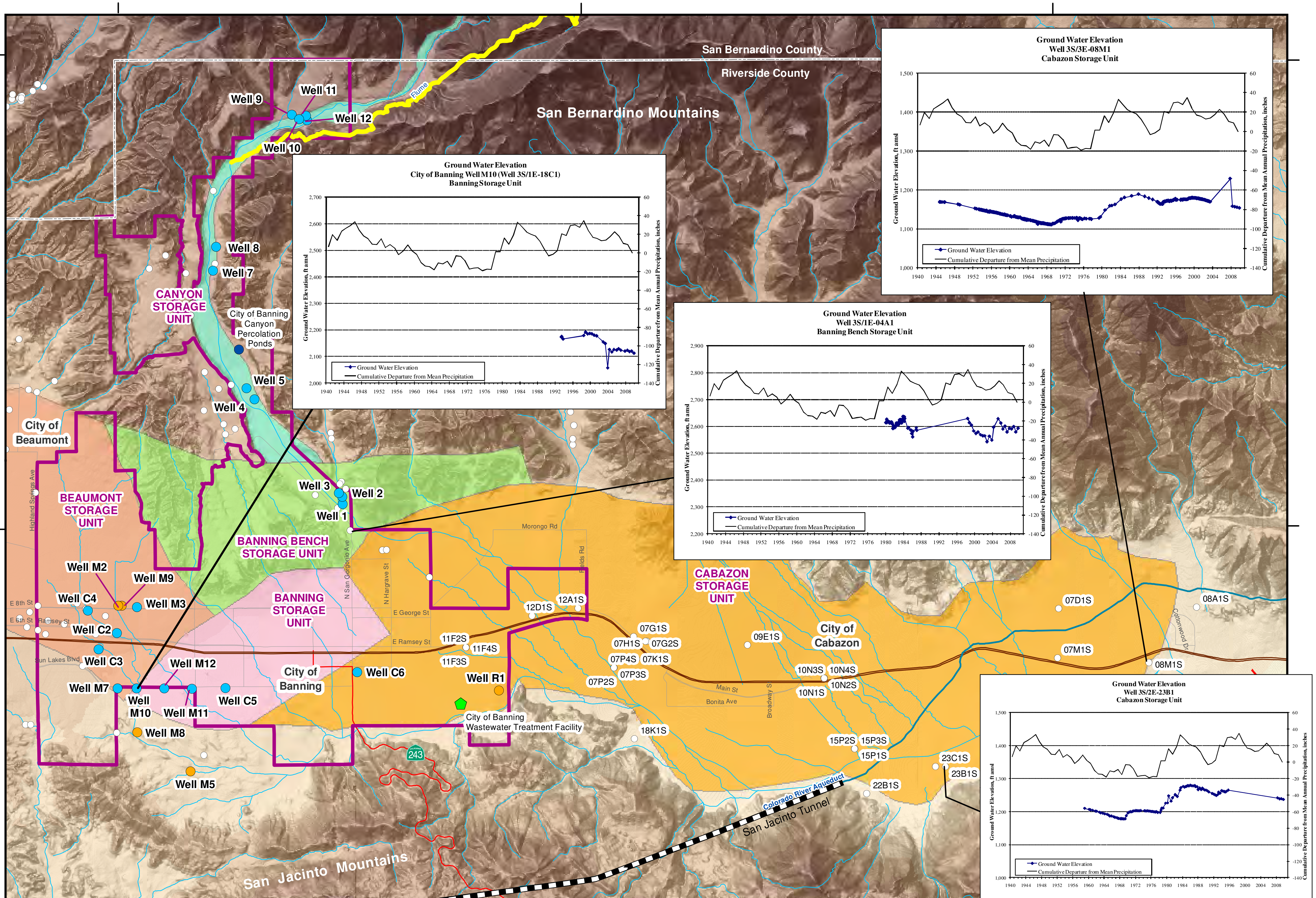
5.2 Frequency and Magnitude of Supply Deficiencies

Historically, static water level elevations have been observed to fluctuate as much as 80 to 100 feet, however, when plotted against the cumulative departure from mean precipitation, it is observed that there is a direct relationship of precipitation trends and ground water elevation trends. An increase in cumulative departure is mirrored by an increase in water level elevations, and a decrease in cumulative departure from mean precipitation is mirrored by a decrease in ground water elevations (see Figure 5-4). Historically, even during dry periods, the City of Banning has been able to meet the water demand of its customers with available ground water supplies.

5.3 Plans to Affirm a Reliable Water Supply

SGPWA has overseen the completion of Phase I of the East Branch Extension, which can deliver 8,650 acre-feet of water per year. SGPWA is currently working in cooperation with the San Bernardino Valley Municipal Water District and the California Department of Water Resources Division of Engineering to construct the second phase of the East Branch Extension Project. Phase II construction of the East Branch includes additional water transmission facilities as well as will allow utilization of the full

SELECTED WELL HYDROGRAPHS SHOWING TRENDS ALONG WITH CUMULATIVE DEPARTURE FROM MEAN PRECIPITATION



10-May-11

Prepared by: DWB. Map Projection: UTM 1983, Zone 11.

DRAFT

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Figure 5-4

17,300 acre-ft/yr allotment of SWP water. The California DWR certified the Environmental Impact Report and approved the project on March 6, 2009. Construction of the proposed project is scheduled to be complete in 2013[11]. The City began purchasing SWP water in 2008 from the San Gorgonio Pass Water Agency (SGPWA) for recharge into the Noble Creek Spreading Grounds that can then be extracted by the City through their existing wells in the Beaumont Storage Unit. The City intends to continue to purchase water from SGPWA.

The City of Banning may also consider the use of greywater to reduce potable water demand. Greywater is wastewater from baths, sinks, dishwashers, and washing machines. Greywater can be recycled and used for irrigation, toilets, and exterior washing. This requires the installation of a dual wastewater plumbing system to separate greywater from blackwater. A typical system consists of a treatment system, bilge pump, holding tank, and irrigation or leaching system. Greywater systems are not possible in all areas and their applicability will depend on location, soil type, and groundwater levels. These systems require regular or periodic maintenance, which is the responsibility of the owner. The California Building Standards Commission has specific requirements for greywater systems including the submittal and approval of a plot plan by the City before a permit can be issued for a greywater system.

5.4 Water Shortage Contingency Plan

5.4.1 Three Year Minimum Water Supply

The City of Banning's minimum water supply for the current year and the next three years is shown in Table 5-5. The water supply and demand were based on dry-year assumptions and values described in Sections 3 and 4. Demand values include 20x2020 reductions. Should an extended drought occur over the next three years, the City would have a surplus of water and be able to meet the water needs of its customers.

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[11] Per California Department of Water Resources "Findings of Fact and Statement of Overriding Consideration" March 6, 2009, completion is in 2012, although per the Supplemental Water Supply Planning Study (Webb, 2009) , completion is scheduled in 2013.

Table 5-5
Minimum Water Supply During Multiple-Dry Years
(acre-ft/yr)

	2010[1]	2011	2012	2013
Total Water Supply	N/A	11,432	11,476	11,520
Total Demand	N/A	6,987	7,286	7,586
Supply Surplus	N/A	**4,445**	**4,190**	**3,935**

[1] 2010 values are actual supplies utilized by the City in 2010. The DWR Guidebook requires inclusion of 2010, however as the deadline for submittal of the UWMP has been extended to 2011, all 2010 values are not projections or estimates, but are actual values, and therefore are not estimated in multiple-dry year supplies.

5.5 Preparation for Catastrophic Water Supply Interruptions

The City of Banning has an Emergency Response Plan as required by the California Department of Health Services – Drinking Water Division and has submitted a Security Vulnerability Assessment Report as required by the Federal EPA. The guidelines of both of these items are presently being followed by the Water Utility Department.

The City of Banning adopted its Water Shortage Contingency Plan (WSCP) under City Ordinance 1040 in 1991. As required by Assembly Bill No. 1881, the City was required to adopt landscaping and water conservation ordinances which are as effective as the States model water efficiency landscaping ordinance. The City Council adopted Resolution No 2010-06 on January 26, 2010. The current water conservation ordinances along with previous versions of the City codes and ordinances are included in Appendix I. The WSCP outlines a plan of action in the event of a water shortage caused by loss of electrical power, an earthquake, pipeline breakage, or any other potential water shortage caused by a disaster or facility failure that results in the City's potential inability to meet the water demands of its customers.

5.5.1 Regional Power Outage, Earthquake, or Other Disaster

The City of Banning's sphere of influence overlays several faults, the most prominent being the Banning Fault and portions of the San Gorgonio Fault Zone. The Banning Fault defines the north side of the Banning Bench Storage Unit. It is characterized by a right-lateral strike-slip displacement on the northwest trending faults with a normal dip-slip displacement. Matti and others (1985) applied the name San Gorgonio Pass Fault Zone to a group of Quaternary reverse, thrust, and tear faults that extends from the Whitewater area westward to the Calimesa area and defines the boundary of the Banning Storage Unit (USGS, 2006). An earthquake could result in the loss of power and damage to the water distribution system and aboveground storage reservoirs.

The City of Banning has its own field crews, equipment, and materials to make immediate responses and repairs to the water system. Stand-by crews are on call at all times to respond promptly to emergencies.

Water production wells are located throughout the service area, which provides the ability to supply water in different portions of the City. Also, the City has a 12" emergency inter-tie connection with BCVWD at the western boundary of the service area, located at the intersection of Highland Springs Avenue and Sun Lakes Blvd.

Wells 8, 9, 10, C-2 and M-12 have an emergency power source available to continue to operate when the power fails. Wells 1, 3, 4, and 5 do not have an emergency power supply, but have the ability to provide water during an emergency. Table 5-6 summarizes the City's wells with emergency power source and anticipated capacity during auxiliary backup. It should be noted that Wells 8, 9 and 10 backup systems require manual turn on. Additionally, Wells 1, and 3 are equipped with both electric pumps and Pelton wheels, and Well 4 and 5 are equipped with only a Pelton Wheel pump which also allow these wells to provide water in the event of an emergency. Pelton wheel pumps allow these wells to be operated by a hydraulic-driven pump using existing water under pressure in the distribution system. If additional water supply capacity is needed, portable generators can be obtained to operate other remaining wells and booster stations (personal communication with Banning Superintendent Perry Gerdes, 2011).

The total water available from the use of these 9 wells is 6,850 gpm or 30.3 acre-ft/day (City of Banning dry-year capacities, City of Banning Public Works, 2011). The emergency supply of the production wells alone would be sufficient to meet the average daily demand for 2010 of 20.7 acre-ft/day (see Table 3-8). However, if the need arises, additional water is available in above ground storage as shown in Table 5-7 (CDPH Engineering Report for the City of Banning, 2006). The total emergency above ground water supply available is 67.1 acre-feet. Total combined emergency supply from production wells and above ground reservoirs and tanks is 97.4 acre-feet. It should be noted that the High Valley Reservoir is exclusively used by the High Valley Water District and the associated storage is not included in emergency supplies for the City.

In an emergency situation, the City needs to meet not just its average water demand, but its peak water demand as well. In the Water System Hydraulic Modeling Report (Montgomery Watson Harza, 2002) the City's peak water demand was estimated to be 2.24 times the average daily demand. The City's current emergency water supply will meet its peak water demand temporarily. Table 5-6 shows the City's wells which will be used for emergency supplies. Table 5-7 shows backup reservoirs to be utilized in the event of power failure or emergency.

Table 5-6
Wells with Emergency Generators and Backup Systems

Well	Location	Total Capacity GPM	Total Capacity Acre-ft/Day	Remarks
Well 1	Banning Bench Storage Unit	1,250	5.5	Pelton Wheel
Well 3	Banning Bench Storage Unit	500	2.2	Pelton Wheel
Well 4	Banning Canyon Storage Unit	600	2.7	Pelton Wheel
Well 5	Banning Canyon Storage Unit	550	2.4	Pelton Wheel
Well 8	Banning Canyon Storage Unit	550	2.4	Backup Portable Generator
Well 9	Banning Canyon Storage Unit	400	1.8	Backup Portable Generator
Well 10	Banning Canyon Storage Unit	600	2.7	Diesel Engine Drive
Well C2	Beaumont Storage Unit	1,000	4.4	Generator
Well M12	Banning Storage Unit	950	4.2	Generator
	Total	**6,850**	**30.3**	

Table 5-7
Available Emergency Reservoir Storage

Available Reservoirs	Total Above Ground Storage (MG)	Total Above Ground Storage (acre-feet)
Brinton Reservoir	8	24.6
C2 Tank	0.22	0.7
C3 Tank	0.06	0.2
C4 Tank	0.05	0.2
C5 Tank	0.05	0.2
Mountain Tank	0.025	0.1
Receiving	0.024	8.0
San Gorgonio Reservoir No. 1	2.60	6.1
San Gorgonio Reservoir No. 2	2.00	3.1
San Gorgonio Reservoir No. 3	1.00	4.6
Southwest Reservoir	1.50	6.4
Sunset Reservoir No. 1	2.1	6.4
Sunset Reservoir No. 2	2.1	6.4
Total	**19.7**	**67.1**

5.6 Mandatory Prohibitions

The City's WSCP consists of four stages of action to progressively reduce water consumption during increasingly dramatic water shortages. Table 5-8 shows a rationing plan the City could adopt to achieve the reduction goal listed for each stage.

Table 5-8
Rationing Stages and Reduction Goals

Shortage	Stage of Action	Reduction Goal	Type of Program
Up to 15%	1	15%	Voluntary
15% to 25%	2	25%	Mandatory
25% to 35%	3	35%	Mandatory
35% to 50%	4	50%	Mandatory

5.6.1 Stage of Action 1

Stage 1 occurs when the City of Banning is able to meet all of the demands of its customers in the immediate future. During this stage, the City will recommend voluntary conservation measures. All water users will be advised to use water wisely, prevent the waste or unreasonable use of water, and reduce water consumption to levels necessary for ordinary domestic and commercial purposes.

5.6.2 Stage of Action 2

Stage 2 occurs when a sudden and unexpected water supply shortage occurs that prevents the City from meeting the water demands of its customers. If this should occur, the City Council shall immediately hold a public hearing wherein consumers of the water supply shall have the opportunity to protest and to present their respective needs to the Council. No public hearing will be required in the event of a breakage or failure of a dam, pump, pipeline, or conduit. At the public hearing, the Council may declare a water shortage emergency condition and the following mandatory rules and regulations shall be in effect immediately following such declaration:

a) Washing driveways, parking lots, or other hard surfaced area, or building exteriors at any time, except to alleviate immediate fire hazards, is prohibited;
b) Parks, golf courses and school grounds are to be irrigated during nighttime hours only, between sunset and sunrise;
c) Lawn watering and landscape irrigating, including construction meter use, is prohibited between the hours of 10:00 am to 5:00 pm;
d) Running water shall not be used for washing privately owned vehicles. A bucket may be used for the washing of vehicles and only hoses equipped with shut-off nozzles may be used for rinsing;
e) Restaurants are requested not to provide drinking water to patrons except by request;
f) Commercial nurseries shall use water only during the hours from midnight to 6:00 am. Irrigation of propagation beds and watering of livestock is permitted as necessary during any hours;
g) Golf courses using reclaimed water are exempted from these restrictions.

5.6.3 Stage of Action 3

Water supply and demand will be continuously monitored by the Water Operations Superintendent. If further reductions in water consumption are required, Stage 3 will be declared following a public hearing as set forth in Stage 2 and the City Council will declare an emergency water supply shortage and the following mandatory water conservation measures shall apply:

a) Parks and schools shall be watered on alternate days during the hours between sunset to sunrise, the schedule of which shall be set following the public hearing;
b) Golf courses that utilize domestic water from the City of Banning's domestic system may irrigate greens only during the hours between sunset to sunrise. Golf courses utilizing reclaimed water are exempted from this restriction;
c) Other lawn watering and landscape irrigating, including construction water use, are restricted as follows: customers with even numbered street addresses may water only on even numbered days, customers with odd numbered street addressees may water only on odd numbered days, and no watering or irrigating shall be done between the hours of 10:00 am to 5:00 pm on any day;
d) Washing down of driveways, parking lots, or other paved surfaces is prohibited;
e) Washing of vehicles is restricted to commercial car wash establishments which recycle their water;
f) Filling or adding water to swimming pools, wading pools, spas, ornamental ponds, fountains and artificial lakes is prohibited;
g) Restaurants shall not serve drinking water to patrons except by request;
h) No new construction meter permits shall be issued by the Agency;
i) Construction metered water shall not be used for earth work or road construction purposes;

j) Watering of livestock is permitted as necessary during any hours;
k) Commercial nurseries may use water only between the hours of midnight and 6:00 am. Irrigation of propagation beds is permitted as necessary during any hours. Commercial nurseries utilizing reclaimed water are exempted from this restriction.

5.6.4 Stage of Action 4

Stage 4 will occur if the water shortage condition continues or worsens and measures to reduce water use required by Stage 3 are not adequate. Following a declaration by the City Council that an emergency water supply shortage due to a major failure in a supply of distribution facility exists, the following mandatory water conservation measures shall apply:

a) Watering of parks, school grounds and golf courses is prohibited, except by reclaimed water;
b) Watering of lawn and irrigating of landscape is prohibited;
c) Washing down of driveways, parking lots, or other paved surfaces is prohibited;
d) Washing of vehicles is prohibited, except when done by commercial car wash establishments using recycled or reclaimed water;
e) Filling or adding water to swimming pools, wading pools, spas, ornamental ponds, fountains and artificial lakes is prohibited;
f) No serving of drinking water by restaurants to patrons except by request;
g) No issuing of new construction meter permits by the City of Banning;
h) Turning off and locking all existing construction meters;
i) Discontinuing all watering and irrigating of commercial nurseries. Those utilizing reclaimed water are exempted from this restriction. Watering of livestock is permitted as necessary.

5.6.5 Implementation

During all stages of a water shortage, the Water Operations Superintendent shall monitor the supply and demand for water on a daily basis to determine the level of conservation required and notify the City Council of the necessity for the implementation or termination of each stage. Each declaration of the Council's implementation or termination of a water conservation stage shall be published at least once in a newspaper of general circulation.

5.7 Penalties

5.7.1 Criminal Penalties

Violation of any mandatory restriction or requirement of City Ordinance 1040 shall constitute a misdemeanor. Conviction of this misdemeanor will result in imprisonment in the county jail for not more than thirty days or a fine of not more than $1,000, or by both such fine and imprisonment.

5.7.2 Civil Penalties

In addition to criminal penalties, violators of the mandatory restrictions shall be subject to civil action initiated by the City.

1) First Violation. For a first violation, the City shall issue a written notice of violation to the water user.
2) Second Violation. For a second violation within a 12-month period, a one-month surcharge of 25% of the previous month's water bill will be imposed.
3) Third Violation. For a third violation within a 12-month period, a one-month penalty surcharge of 50% of the previous month's water bill will be imposed. In addition to the surcharge, the City may install a flow-restricting device at the meter at the expense of the violator.
4) Subsequent Violations. For any subsequent violation within 24 calendar months after a first violation, water service will be discontinued. Service will not be restored until the Water Operations Superintendent has determined that the water user has provided reasonable assurances that future violations will not occur.

5.8 Revenue Impacts

The Water Department's principal source of operating revenue is from water rates. A 50% reduction in water consumption would have a large impact on the Department's revenue. This loss could be in part offset by penalties collected for violations of mandatory restrictions. Provisions for an emergency reserve were accounted for in the City's current water rates and water service connection fee. At a minimum, this reserve should maintain at a minimum a 60-day operating reserve.

5.9 Water Quality

The City of Banning's existing groundwater quality was reviewed and found to be excellent. Based on water quality data for the period ranging from 1990 to 2009, future groundwater quality is also expected to be of high quality. Moreover, the City's water supply isn't expected to be threatened by water quality issues in the future.

Most other water quality concentrations, including nitrate (as NO_3), are currently under the maximum contaminant level (MCL) or action levels. Historically, the only constituents occurring above MCLs were iron and aluminum in most wells. Lead was also detected in Wells 5, 8, 11, 12 and C3 above the US EPA Treatment Technique value which requires systems to control the corrosiveness of their water. If more than 10% percent of tap water samples exceed the action level, water systems must take additional steps. Lead has not been detected above the Treatment Technique value in any wells since 2006 (see Appendix J). Fluoride was also detected above the Secondary MCL in Well C3 in March of 1994.

In addition, water quality is considered very good in the Banning area, with current total dissolved solids (TDS) concentrations (Spring 2009) ranging from approximately 140 to 250 milligrams per liter (mg/L). The secondary MCL range for TDS in drinking water is 500-1000 mg/L. The TDS Maximum Benefit water quality objective for the Beaumont Management Zone is 330 mg/L as described in the 2004 RWQCB Basin Plan Amendment. None of the Cities' wells sampled were detected above the basin objective. As these results show, TDS is not a problem in the City's groundwater sources, and therefore, reducing dissolved solids is not needed.

5.10 Drought Planning

5.11 Twenty-Five Year Comparison

The water demands based on projected population growth presented in Section 3 are used for the twenty five year comparison. Population growth data was provided by The City of Banning 2008 Draft Housing Element Update. In addition to the inherent uncertainties of population growth, the year of buildout is unknown, however, estimated to occur in 2061 (based on General Plan population at buildout estimates).

5.11.1 Supply vs. Demand by Population

The individual components for the water supply totals are provided in Table 4-1 and the individual components for determining the demand totals including 20x2020 reductions are shown in Table 3-8. Over the next twenty-five years, based on anticipated demand from population growth, the City of Banning is anticipated to have a surplus of water to meet its customer's water demand.

5.12 Below Normal Water Year Comparisons

Table 5-9 compares the current and projected water supply and demand based on the forecasted increase in population during an average, a single-dry, and multiple-dry water years. Over the next twenty-five years, the City of Banning is anticipated to have a surplus of water to meet its customer's water demand.

Total water supply during average and dry years was described in detail in Section 4 and values are shown in Table 4-1. Supplies were compared to population based demand as they more accurately reflect actual water usage by the City. Estimates of water demand using landuse was assumed to be conservative as comparison of 2010 projections (Table 3-3) with actual 2010 City demands (Table 3-1, based on water use records) showed that the projections were higher than actual demand. During dry years demand will change. Average demand values were discussed in Section 3.3. Studies conducted by Carlsbad Municipal Water District (2000), have shown that residential urban water demands are about seven percent greater and irrigation water demands are about nine percent greater than normal during hot, dry weather. Total demand during dry years will also decrease due to voluntary and mandatory conservation measures as outlined in the City's Water Shortage Contingency Plan. For a single-dry year, residential water demand was assumed to increase seven percent, irrigation demand to increase nine percent, and total demand to decrease ten percent. During multiple-dry years, residential and irrigation demands were assumed to increase by the same percentage, but total demand was assumed to decrease by 25 percent due to the implementation of Stage 2 of the Water Shortage Contingency Plan.

As shown in Table 5-9, the City will have a supply surplus during dry years through 2035. If needed, the City may also extract water from their groundwater storage units above the amounts included in the total supply projections shown on Table 5-9. The vast amount of groundwater in storage within the City's area, provides a reliable safety margin for the City in times of drought.

Table 5-9
Average, Single-Dry, and Multiple-Dry Water Years Supply and Demand Comparisons Including 20x2020 Demand Reductions
(acre-ft/yr)

	Average Water Years					
	2010[1]	2015	2020	2025	2030	2035
Total Supply[2]	9,552	15,563	15,792	16,045	16,323	16,628
Total Demand[3]	7,586	10,376	10,183	11,243	12,413	13,705
Supply Surplus	**1,966**	**5,187**	**5,609**	**4,802**	**3,909**	**2,923**
	Single-dry Water Years					
	2010[1]	**2015**	**2020**	**2025**	**2030**	**2035**
Total Supply[4]	N/A	12,043	12,314	12,608	12,928	13,235
Total Demand[5]	N/A	9,821	9,638	10,642	11,749	12,972
Supply Surplus	N/A	**2,222**	**2,675**	**1,967**	**1,179**	**263**
	Multiple-dry Water Years					
	2010[1]	**2015**	**2020**	**2025**	**2030**	**2035**
Total Supply[6]	N/A	12,784	13,038	13,316	13,619	13,926
Total Demand[5]	N/A	8,184	8,032	8,868	9,791	10,810
Supply Surplus	N/A	**4,600**	**5,006**	**4,448**	**3,828**	**3,116**

[1]2010 values are actual supplies utilized by the City in 2010. The DWR Guidebook requires inclusion of 2010, however as the deadline for submittal of the UWMP has been extended to 2011, all 2010 values are not projections or estimates, but are actual values, and therefore are not estimated in multiple-dry year supplies.
[2] Average year supplies are described in detail in Table 5-2.
[3] Average year demands are described in detail in Table 3-8 which include 20x2020 reductions.
[4] Single-dry year supplies are described in detail in Table 5-3.
[5] Dry year demand conditions are anticipated to increase irrigation by 9% and residential demands by 7% with an overall decrease in demand by 10% for single-dry years from average year conditions described in detail in Table 3-8. For multiple-dry years the same 9% and 7% increase is anticipated with an overall decrease by 25% from average year conditions described in detail in Table 3-8, (based on studies conducted by the Carlsbad Municipal Water District, 2000).
[6] Multiple-dry year supplies are described in detail in Table 5-4.

6.0 DEMAND MANAGEMENT MEASURES

Law 10631

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

(f) Provide a description of the supplier's water demand management measures. This description shall include all of the following:

1)A description of each water demand management measure that is currently being implemented, or scheduled for implementation, including the steps necessary to implement any proposed measures, including, but not limited to, all of the following:

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

2)A schedule of implementation for all water demand management measures proposed or described in the plan.

3)A description of the methods, if any, that the supplier will use to evaluate the effectiveness of water demand management measures implemented or described under the plan.

4)An estimate, if available, of existing conservation savings on water use within the supplier's ability to further reduce demand.

(g) An evaluation of each water demand management measure listed in paragraph (1) of subdivision (f) that is not currently being implemented or scheduled for implementation. In the course of the evaluation, first consideration shall be given to water demand management measures, or combination of measures, which offer lower incremental costs than expanded or additional water supplies. This evaluation shall do all of the following:

1)Take into account economic and noneconomic factors, including environmental, social, health, customer impact, and technological factors.

2)Include a cost-benefit analysis, identifying total benefits and total costs.

3) Include a description of funding available to implement any planned water supply project that would provide water at a higher unit cost.

4) Include a description of the water supplier's legal authority to implement the measure and efforts to work with other relevant agencies to ensure the implementation of the measure and to share the cost of implementation.

(h) Urban water suppliers that are members of the California Urban Water Conservation Council and submit annual reports to the council in accordance with the "Memorandum of Understanding Regarding Urban Water Conservation in California" dated September 1991, may submit the annual reports identifying water demand management measures currently being implemented, or scheduled for implementation, to satisfy the requirements of subdivisions (f) and (g).

6.1 Water Demand Management Measures

The City of Banning is committed to implementing water conservation and recycling programs. The California Urban Water Conservation Council (CUWCC) developed a Memorandum of Understanding (MOU) to provide guidance for implementing conservation measures as a way to manage water demands. The MOU originally included a list of 14 Best Management Practices (BMPs) that define industry standards for implementing demand management measures. More recently, these BMPs were organized into five categories:

- Utility Operations Foundational BMPs
    - Utility Operations
    - Education
- Programmatic BMPs
    - Residential
    - Commercial, Industrial and Institutional (CII)
    - Landscape

Table 6-1 lists the old BMP names and numbers along with the new BMP category. The City is not currently a signatory to the MOU. However, the City is in various stages of implementing the BMPs as discussed in the following sections.

Table 6-1
CUWCC Demand Management Program BMP Naming Changes

Old BMP Names and Number	New BMP Category
1. Residential Water Surveys Programmatic: Residential	Residential
2. Residential Plumbing Fixture Retrofits Programmatic: Residential	Programmatic: Residential
3. System Water Audits, Leak Detection, and Repair	Foundational: Utility Operations
4. Metering and Commodity Rates	Foundational: Utility Operations
5. Large Landscape Audits	Programmatic: Landscape
6. High Efficiency Washing Machine Rebates	Programmatic: Residential
7. Public Information Programs	Foundational: Education
8. School Education Programs	Foundational: Education
9. CII Conservation Programs	Programmatic: CII
10. Wholesale Agency Assistance	Foundational: Utility Operations
11. Retail Conservation Pricing	Foundational: Utility Operations
12. Conservation Coordinator	Foundational: Utility Operations
13. Water Waste Prohibition	Foundational: Utility Operations
14. Residential Ultra Low Flush Toilet (ULFT) Replacement	Programmatic: Residential

The sections below provides a status of implementation to date of each of the 14 BMPs within the City of Banning:

6.2 BMP 1 – Water Surveys Programs for Single-Family Residential and Multi-Family Residential Customers

This BMP consists of developing and implementing a strategy targeting and marketing water use surveys to single-family residential and multi-family residential customers. For each reporting period, direct contact via letter or telephone shall be made to not less than 1.5% of single-family residential customers and 1.5% of multi-family residential customers, with a 10-year target of 15%. Water use surveys shall address indoor and outdoor components and contain, at a minimum, the following elements:

- Check for leaks, including toilets, and faucets, and check meters.
- Check showerhead flow rates, aerator flow rates, and offer to replace or recommend replacement, as necessary.
- Check toilet flow rates and offer to install or recommend the installation of a displacement device or direct the customer to an Ultra-Low Flush Toilet (ULFT) replacement program, as necessary; replace leaking toilet flapper, as necessary.
- Check irrigation system and timers.
- Review or develop customer irrigation schedule.
- Measure currently landscaped area (recommended).
- Measure total irrigable area (recommended).

6.2.1 Implementation or Scheduled Implementation

The City of Banning has not implemented this BMP. It is recommended that the City of Banning commence implementing this BMP in the near future. The City shall develop and implement a strategy for targeting and marketing water use surveys to single-family and multi-family residential customers by the end of the first reporting period following the date that the implementation was set to commence. The program shall continue until water surveys have been completed for 15% of single-family residential customers and 15% of multi-family residential customers in a ten year period.

6.2.2 Methods to Evaluate Effectiveness

This BMP shall be considered effective if water surveys have been completed for 15% of single-family residential customers and 15% of multi-family residential customers within ten years. The CUWCC estimates the potential water savings for homes constructed prior to 1980 are 9 gallons per day per capita (gpcd) and 3.4 gpcd for homes constructed post 1980. In both situations, outdoor use reductions are estimated to be 10%.

6.3 BMP 2 – Residential Plumbing Retrofit

This BMP consists of developing a targeting and marketing strategy to distribute or directly install high quality, low-flow showerheads (rated 2.5 gpm or less), toilet displacement devices (as needed), toilet flappers (as needed), and faucet aerators (rated 2.2 gpm or less), where required, to single-family and multi-family residences constructed prior to 1992. However, the BMP target is no less than 10% of single-family connections and multi-family units shall receive and install retrofit kits each reporting period. This BMP shall be implemented until 75% of single-family residences and multi-family units are fitted with high-quality, low-flow showerheads. The number and type of retrofits completed, devices distributed, and program costs shall be tracked.

6.3.1 Implementation or Scheduled Implementation

Beginning January 15, 2005, The City started a program to distribute low-flow showerheads to its residential customers, approximately 200 units were available to the public at the Public Works customer service counter. In addition, since 2005 the City has passed out between 1,500 and 2,000 conservation kits to the public. The contents of the kits contain 1) Toilet tank leak detection test tablets, 2) Bag to displace water within the toilet tank, and 3) Shower flow restrictors. The kits continue to be distributed three times a year at Stagecoach Days, the Emergency Disaster Fair, and the Recycling Fair, all of which are City-wide public events.

6.3.2 Methods to Evaluate Effectiveness

The effectiveness of low-flow showerheads and ULFTs has been well established. CUWCC estimates the water savings to homes constructed prior to 1980 to be 8.5 gpcd and 2.9 gpcd to homes constructed after 1980.

6.4 BMP 3 – System Water Audits, Leaks Detection and Repair

The implementation of this BMP shall consist of the following actions:

a) Annually complete a prescreening system audit to determine the need for a full-scale system audit. The prescreening system audit shall be calculated as follows:
   i) Determine metered sales;
   ii) Determine other system verifiable uses;
   iii) Determine total supply into the system;
   iv) Divide metered sales plus other verifiable uses by total supply into the system. If this quantity is less than 0.9, a full-scale audit is indicated.
b) When indicated, agencies shall complete water audits of their distribution systems using methodology consistent with that described in AWWA's Water Audit and Leak Detection Guidebook.
c) The City shall advise customers whenever it appears possible that leaks exist on the customer's side of the meter; perform distribution system leak detection when warranted and cost-effective; and repair leaks when found.

6.4.1 Implementation or Scheduled Implementation

The City is in compliance with this BMP through its normal operations. The City maintains records of metered sales, other system uses, and total production. From these records, system water losses on average are approximately 6 to 10 percent of total water produced. The City currently repairs major leaks to the distribution system as soon as possible; and, under the Capital Improvement Plan, old leaking pipes are continually being replaced. In addition, The City is in consultation with Johnson Controls for performance of a water system audit to further evaluate and reduce system losses.

6.4.2 Methods to Evaluate Effectiveness

The City reviews records to confirm system water losses do not exceed 10 percent. System losses are expected to decrease due to improvements to the distribution system under the Capital Improvement Plan as well as through implementation of recommendations from the upcoming system water audit.

6.5 BMP 4 – Metering with Commodity Rates for All New Connections and Retrofit of Existing Connections

The implementation of this BMP shall consist of the following actions:

a) Require meters for all new connections and billing by volume of use.
b) Establish a program for retrofitting existing unmetered connections and billing by volume of use.
c) Identifying intra- and inter-agency disincentives or barriers to retrofitting mixed use commercial accounts with dedicated landscape meters, and conducting a feasibility study to assess the merits of a program to provide incentives to switch mixed use accounts to dedicated landscape meters.

6.5.1 Implementation or Scheduled Implementation

The City is fully metered for all customer sectors, including meters for single-family residential, commercial, industrial, and all public facilities and will continue to meter all new connections. The City has investigated the feasibility of separately metering all of the multi-family dwelling units in the service area and has determined that it isn't feasible.

The City to date has installed dedicated landscape irrigation meters for the three largest landscape irrigation users in the City (Sunlakes Development, Caltrans, and the City Park system) and in the process of installing landscape irrigation meters for the City's School District facilities.

6.6 BMP 5 – Large Landscape Conservation Programs and Incentives

This BMP shall be implemented by providing support and incentives to non-residential customers to improve landscape water use efficiency, developing ETo-based water use budgets for 90 percent of accounts with dedicated irrigation meters, and provide billing cycle notices of the relationship between the budget and actual consumption. The City must develop and implement a water use survey program for Commercial/Industrial/Institutional (CII) accounts with mixed-use meters, directly contact and offer surveys to no less than 20% of CII accounts each reporting period, actively market landscape surveys to unmetered service areas with large landscapes or inefficient water use, and offer the following measures when cost effective:

- Landscape water use analysis/surveys.
- Voluntary water use budgets.
- Installation of dedicated landscape meters.
- Training (multi-lingual where appropriate) in landscape maintenance, irrigation system maintenance, and irrigation system design.
- Financial incentives to improve irrigation system efficiency such as loans, rebates, and grants for the purchase and/or installation of water efficient irrigation systems.
- Follow-up water use analyses/surveys consisting of a letter, phone call, or site visit where appropriate.

Survey elements will include: measurement of landscape area; measurement of total irrigable area; irrigation system check, and distribution uniformity analysis; review or develop irrigation schedules, as appropriate; provision of a customer survey report and information packet. The number of surveys offered, the survey findings, the devices installed, the potential water savings, and the survey costs shall be tracked. Information on climate-appropriate landscape design and efficient irrigation equipment/management shall be provided to new customers and change-of-service customer accounts.

6.6.1 Implementation or Scheduled Implementation

In 1992, the City Council approved City Ordinance No.1012, adding xeriscape requirements to the City Code (City Code 31-8). These requirements apply to all new development, rehabilitated landscaping for CII accounts, schools, parks, and golf courses. This ordinance specifies turf limitations, drought-resistant plant requirements for non-turf areas, irrigation efficiencies, and the submittal of landscape plans to be checked for compliance with xeriscape requirements. In addition. as required by Assembly Bill No. 1881, the City was required to adopt landscaping and water conservation ordinances which are as effective as the States model water efficiency landscaping ordinance. The City Council adopted Resolution No 2010-06 on January 26, 2010. The current water conservation ordinances along with previous versions of the City codes and ordinances are included in Appendix I. Since 2005 two of the three largest users of water for landscape irrigation (Sunlakes Development, Caltrans, and the City Park system) have installed landscape meters and implemented the use of ETo based irrigation controllers. In addition, the City has planted water friendly plants and drip irrigation system in the median on the main street in Banning.

6.6.2 Methods to Evaluate Effectiveness

The evaluation of landscape plans by the community development director will ensure xeriscape requirements are being implemented. The requirements established in City Ordinance No. 1012 are known to conserve water.

6.6.3 Estimate of Existing Conservation Savings

The City has not yet evaluated the conservation savings from this program.

6.7 BMP 6 – High-Efficiency Washing Machine Rebate Programs

This BMP shall be implemented by offering customers a financial incentive, if cost effective, for the purchase of high-efficiency clothes washing machines (HEWs) that meet a wateruse factor of 9.5 or less.

Any financial incentive offered shall not be less than the marginal benefits of the water savings reduced by the necessary expense of administering the incentive program. Incentive levels shall be calculated by using methods found in A Guide to Customer Incentives for Water Conservation prepared by Barakat and Chamberlain for the California Urban Water Agencies (CUWA), CUWCC, and US EPA, in February 1994. The City is not required to implement a financial incentive program if the maximum cost-effective rebate is less than $50.

6.7.1 Implementation or Scheduled Implementation

To date, due to funding issues, the City has been unable to offer this incentive in addition to other conservation expenditures noted herein.

6.8 BMP 7 – Public Information Programs

Implementation methods shall at least consist of implementing a public information program promoting water conservation and water conservation related benefits. The program should include, but is not limited to, providing speakers to employees, community groups, and the media; using paid and public service advertising; using bill inserts; providing information on customers' bills showing use in gallons per day for the last billing period compared to the same period the year before; providing public information to promote water conservation practices; and coordinating with other government agencies, industry groups, public interest groups, and the media.

6.8.1 Implementation or Scheduled Implementation

The City has initiated several water conservation programs to educate its utility customers in regards to various approaches to conserve water. At City Hall water conservation information/pamphlets are displayed year round as well as at public city-wide events. Public Works employees visit school classrooms and make presentations on water conservation and distribute brochures with additional conservation information. The superintendent of Public Works is in continuous contact with the staff at the Sun Lake Golf Course to manage water more efficiently. The City will continue to expand public education on water conservation.

6.9 BMP-8 – School Education Programs

Implementation methods shall consist of implementing a school education program to promote water conservation and water conservation related benefits. Programs shall include working with school districts and private schools in the water suppliers' service area to provide instructional assistance, educational materials, and classroom presentations that identify urban, agricultural, and environmental issues and conditions in the local watershed. Education materials shall meet the state education framework requirements and grade appropriate materials shall be distributed to grade levels K-3, 4-6, 7-8, and high school.

6.9.1 Implementation or Scheduled Implementation

The City has a program where Public Works employees can visit local schools and make presentations on water conditions in the San Gorgonio Pass area and the value of water and water conservation. Educational brochures are also made available to the students. The City plans to encourage more student involvement and awareness by offering scholarships to the winners of water related contests.

6.10 BMP 9 – Conservation Programs for Commercial, Industrial, and Institutional (CII) Accounts

This BMP shall be implemented by identifying and ranking CII accounts according to water use and implementing a program to accelerate the replacement of existing high-water-using toilets with ultra-lowflush (1.6 gallons or less) toilets in CII facilities. In addition, the agency shall either implement a CII water use survey and customer incentive program or achieve water use reductions in the CII sector equaling or exceeding the targets described below. The target water reduction for the CII sector is 10% of baseline use. The agency shall contact and offer, on a repeating basis, water use surveys and customer incentives to at least 10% of the CII customers directly (by mail, telephone or personal visit).

Water use surveys must include a site visit, an evaluation of all water-using apparatuses and processes, and a customer report identifying recommended efficiency measures, their expected payback period, and available agency incentives. Within one year of a completed survey, the agency shall follow-up with a phone call or site visit in regards to customer facility water use and water saving improvements. The agency shall track customer contacts, accounts receiving surveys, follow-ups, and measures implemented. The coverage for this BMP is to audit 10% of the total CII accounts or reduce annual water use by CII accounts by 10% of the annual baseline water use within 10 years of the date implementation is to commence.

6.10.1 Implementation or Scheduled Implementation

The City has commenced implementation of this BMP by installation of waterless urinals in public and government buildings within the City. Table 6-2 below provides a listing of the buildings and number of waterless urinals installed to date. Each urinal has the potential of saving up to 40,000 gallons per year. The City will continue to implement this BMP in the future

Table 6-2
Waterless Urinals

Public/Government Building	Number of Waterless Urinals
City Hall	2
Senior Center	1
Fleet Building	1
Community Center	3
City Maintenance Yard	3
Police Department	2
School District	25
Total	37

6.10.2 Methods to Evaluate Effectiveness

The Commercial/Industrial/Institutional (CII) sector used an average of 3,495[12] acre-ft of water during the period of 2000 to 2004. During the period 2005 through 2010 water average water use for this sector decreased slightly to 3,429 acre-ft/yr, a reduction of approximately 2%. This BMP shall be considered effective if within ten years of implementation the CII annual water use has been reduced by 10%, or 10% of CII accounts accept a water use survey, or the CII ultra-low flush toilet (ULFT) program results in a 3% water savings of the Total Water Savings Potential as defined by Exhibit 8 of the MOU.

[12] The 2005 UWMP reported the average annual water use of the CII (Commercial/Industrial/Institutional) sector as 3,495 acre-ft. Re-evaluation of the data for comparison with the 2005 through 2010 period resulted in an average annual use of 2,346 acre-ft/yr.

6.11 BMP 10– Wholesale Agency Assistance Programs

This BMP shall be implemented by wholesale water suppliers. Wholesale water suppliers shall provide financial incentives, or equivalent resources, as appropriate, beneficial, and mutually agreeable to their retail water agency customers to advance water conservation efforts and effectiveness. All BMPs implemented by retail water agency customers that can be shown to be cost-effective in terms of avoided cost of water from the wholesaler's perspective, using CUWCC cost-effectiveness analysis procedures, will be supported.

The wholesale water agencies shall provide conservation-related technical support and information to all retail agencies that they serve as a wholesale supplier. At a minimum this requires:

- Conducting, funding, and/or promoting workshops that address the following topics:

  a) CUWCC procedures for calculating program savings, costs, and cost-effectiveness;
  b) Retail agencies' BMP implementation reporting requirements; and
  c) The technical, programmatic, strategic, and/or other pertinent issues and developments associated with water conservation activities in each of the following areas: ULFT replacement, residential retrofits, commercial, industrial and institutional surveys, residential and large turf irrigation, and conservation-related rates and pricing.

- Having the necessary staff or equivalent resources available to respond to retail agencies' technical and programmatic questions involving the CUWCC's BMPs and their associated reporting requirements.

When mutually agreeable and beneficial, the wholesaler may enforce all or any part of the conservation related activities that a given retail supplier is obligated to implement under the BMP's cost-effectiveness test.

Wholesale agencies shall work in cooperation with their customers to identify and remove potential disincentives to long-term conservation created by water shortage allocation policies; and to identify opportunities to encourage and reward cost-effective investments in long-term conservation shown to advance regional water supply reliability and sufficiency.

6.11.1 Implementation or Scheduled Implementation

The City is not a wholesale water supplier and, therefore, does not offer financial incentives to retail water agencies to advance water conservation efforts. However, the City has jointly purchased water conservation educational materials with the SGPWA, the State Water Contractor, for distribution to City customers. To date water conservation workshops have not been held in conjunction with SGPWA

6.12 BMP 11 – Conservation Pricing

Implementation methods shall be at least as effective as eliminating non-conservation pricing and adopting conservation pricing. This BMP applies to the pricing of both water and sewer services. Suppliers that supply water but not sewer service shall make good faith efforts to work with sewer agencies so that those sewer agencies adopt conservation pricing for sewer services. Non-conservation pricing provides no incentives for customers to reduce use. Such pricing is characterized by one or more of the following components:

a) Rates in which the unit price decreases as the quantity used increases (declining block rates);
b) Rates that involve charging customers a fixed amount per billing cycle regardless of the quantity used;
c) Pricing in which the typical bill is determined by high fixed charges and low commodity charges. Conservation pricing provides incentives for customers to reduce average or peak use, or both. Rates should be designed to recover the cost of providing service and billing for water and sewer service should be based on metered water use. Such pricing is characterized by one or more of the following components:
a) Rates in which the unit rate is constant regardless or the quantity used (uniform rate);
b) Rates in which the unit rate increases as the quantity used increases (increasing block rates);
c) Seasonal rates or excess-use surcharges to reduce peak demand during summer months;
d) Rates based upon the long-run marginal cost or the cost of adding the next unit of capacity to the system.

6.12.1 Implementation or Scheduled Implementation

The City is in compliance with this BMP. The City has a three-tiered increasing rate structure that applies to all customers. The City's sewer service is based on EDUs. The City defines one EDU as 225 gallons per day. Rates vary per customer type based on an assigned fraction of an EDU. The City does not intend to reestablish the fee for sewer service based on water use. The City is looking at transitioning to either a fixed or drive by Automatic Meter Read (AMR) system that allows the City to monitor each individual customer account for water conservation. The Fixed Based System is made up of antennas which are placed throughout the City. These antennas collect data from the water meter at set intervals within the 24-hour period from each water meter. This data is then downloaded into the City's network system and transferred to a desktop computer. The data is computed for the individual user for billing purposes or alerting the City if the set water use threshold parameter has been exceeded, signaling a possible leak on the property. If this condition arises, the owner of the property would be notified either by e-mail or phone call.

A second system is the Drive-by System. The Drive-by System is similar to the fixed base system. However, meter readings are only picked up by driving by the meters and then downloading the readings after returning to the office. This delays the ability to collect the information immediately and be able to alert the customer of possible leaks within the shortest amount of time. The implementation of the either AMR will facilitate the review of water records and evaluation of effectiveness of conservation programs

6.12.2 Methods to Evaluate Effectiveness

The effectiveness of this BMP can be evaluated by reviewing bill records and pricing structure. To date, due to funding issues and personnel cut-backs, the City has been unable to prepare a review of water records to evaluate the effectiveness of this BMP

6.13 BMP 12 – Conservation Coordinator

The implementation of this BMP shall consist of at least the following actions:

a) Designation of a water conservation coordinator, and support staff if necessary, whose duties shall include the following:

i) Coordination and oversight of conservation programs and BMP implementation;
ii) Preparation and submittal of the CUWCC BMP Implementation Report (for signatories to the MOU);
iii) Communication and promotion of water conservation issues to agency senior management, coordination of agency conservation programs with operations and planning staff, preparation of annual conservation budget, and preparation of the conservation elements of the agency's Urban Water Management Plan.

b) Agencies that are jointly operating regional conservation programs are not expected to staff duplicative and redundant conservation coordinator positions.

6.13.1 Implementation or Scheduled Implementation

The City's Superintendent of Public Works serves as a part-time water conservation coordinator. If the need arises, the City will hire a full-time water conservation coordinator.

6.14 BMP 13 – Water Waste Prohibition

Implementation methods shall be enacted and enforced that prohibit gutter flooding, single pass cooling systems in new connections, non-recirculating systems in all new conveyer car wash and commercial laundry systems, and non-recycling decorative water fountains.

Agencies shall support the efforts to develop state law regarding exchange-type water softeners that would:

1) Allow the sale of only more efficient, demand-initiated regenerating (DIR) models;
2) Develop minimum appliance efficiency standards that increase the regeneration efficiency standard to at least 3,350 grains of hardness removed per pound of common salt used and implement an identified maximum number of gallons discharged per gallon of soft water produced;
3) Allow local agencies, including municipalities and special districts, to set more stringent standards and/or to ban on-site regeneration of water softeners if it is demonstrated and found by the agency governing board that there is an adverse effect on the reclaimed water or groundwater supply.

Agencies shall also include water softener checks in home water audit programs and include information about DIR and exchange-type water softeners in their educational efforts to encourage replacement of less efficient timer models.

6.14.1 Implementation or Scheduled Implementation

In 1991, City Ordinance No. 1039 was passed by the City Council, prohibiting the waste of water. This Ordinance and City Code 31-7 describe the actions that are considered to waste water and the subsequent penalties if a violation were to occur. In 1998, this Ordinance was incorporated into City Ordinance No. 1231. In addition, as required by Assembly Bill No. 1881, the City was required to adopt landscaping and water conservation ordinances which are as effective as the States model water efficiency landscaping ordinance. The City Council adopted Resolution No 2010-06 on January 26, 2010. The current water conservation ordinances along with previous versions of the City codes and ordinances are included in Appendix I.

However to date, there is no record of violations a of enforcement actions with regard to the ordinance.

6.15 BMP 14 – Residential Ultra-Low-Flush Toilets (ULFT) Replacement Programs

Implementation of this BMP shall consist of at least the following actions:

a) Implementation of programs for replacing existing high-water-using toilets with ultra-lowflush (1.6 gallons or less) toilets in single-family and multi-family residences;
b) Programs shall be at least as effective as requiring toilet replacement at time of resale.

6.15.1 Implementation or Scheduled Implementation

The toilet rebate program started in October 2005. The table 6-1 below tabulates the toilet rebates issued since 2005.

Table 6-3
Toilet Rebates by Year

Year	Cost	Number of Toilets
2005/06	$660.00	11
2006/07	$1,964.00	33
2007/08	$2,726	34
2008/09	$3,600	60
2009/10	$2,640	44
2011*	$2,160	36
Total	**$13,750**	**218**

* As of November 10, 2010

7.0 COMPLETED UWMP CHECKLIST

The following table was provided by the State of California Natural Resources Agency Department of Water Resources within the Guidebook to Assist Urban Water Suppliers to Prepare a 2010 Urban Water Management Plan Draft completed December 21, 2010. It is included within this document to ensure that legislative requirements for a 2010 UWMP are satisfied for the City of Banning Draft 2010 Urban Water Management Plan. The table is organized by California Water Code reference legislative number, the blue text under the column "UWMP Location" states where, within the UWMP, the topic is discussed.

Table I-1 Urban Water Management Plan checklist, organized by legislation number

No.	UWMP requirement [a]	Calif. Water Code reference	Subject [b]	Additional clarification	UWMP location
1	Provide baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data.	10608.20(e)	Water Conservation		Section 3.2
2	Include an assessment of present and proposed future measures, programs, and policies to help achieve the water use reductions.	10608.36	Water Conservation		Section 3.3.1
3	Report progress in meeting urban water use targets using the standardized form.	10608.40	Water Conservation		Applies to 2015 and 2020 UWMPs
4	Each urban water supplier shall coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.	10620(d)(2)	External Coordination and Outreach		Section 1.2.1 Appendix B
5	An urban water supplier shall describe in the plan water management tools and options used by that entity that will maximize resources and minimize the need to import water from other regions.	10620(f)	Water Supply (Water Management)		Section 4.9
6	Every urban water supplier required to prepare a plan pursuant to this part shall, at least 60 days prior to the public hearing on the plan required by Section 10642, notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. The urban water supplier may consult with, and obtain comments from, any city or county that receives notice pursuant to this subdivision.	10621(b)	External Coordination and Outreach		Section 1.2.3 Appendix B
7	The amendments to, or changes in, the plan shall be adopted and filed in the manner set forth in Article 3 (commencing with Section 10640).	10621(c)	External Coordination and Outreach		Section 1.3.1 Appendix C
8	Describe the service area of the supplier	10631(a)	Service Area		Section 2.1
9	(Describe the service area) climate	10631(a)	Service Area		Section 2.1.1
10	(Describe the service area) current and projected population . . . The projected population estimates shall be based upon	10631(a)	Service Area	Provide the most recent population data possible.	Section 2.1.2.1

Source: 2010 UWMP Guidebook DRAFT 21-

No.	UWMP requirement [a]	Calif. Water Code reference	Subject [b]	Additional clarification	UWMP location
	data from the state, regional, or local service agency population projections within the service area of the urban water supplier . . .			Use the method described in “Baseline Daily Per Capita Water Use.” See Section M.	
11	. . . (population projections) shall be in five-year increments to 20 years or as far as data is available.	10631(a)	Service Area	2035 and 2040 can also be provided to support consistency with Water Supply Assessments and Written Verification of Water Supply documents.	Table 2-3
12	Describe . . . other demographic factors affecting the supplier's water management planning	10631(a)	Service Area		Section 2.1.2.2
13	Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision (a).	10631(b)	Water Supply	The ‘existing’ water sources should be for the same year as the “current population” in line 10. 2035 and 2040 can also be provided to support consistency with Water Supply Assessments and Written Verification of Water Supply documents.	Section 4.1 Table 4-1
14	(Is) groundwater . . . identified as an existing or planned source of water available to the supplier . . .?	10631(b)	Water Supply	Source classifications are: surface water, groundwater, recycled water, storm water, desalinated sea water, desalinated brackish groundwater, and other.	Section 4-1
15	(Provide a) copy of any groundwater management plan adopted by the urban water supplier, including plans adopted pursuant to Part 2.75 (commencing with Section 10750), or any other specific authorization for groundwater management. Indicate whether a groundwater management plan been adopted by the water supplier or if there is any other specific authorization for groundwater management. Include a copy of	10631(b)(1)	Water Supply		Section 4.0

Source: 2010 UWMP Guidebook DRAFT 21-

No.	UWMP requirement [a]	Calif. Water Code reference	Subject [b]	Additional clarification	UWMP location
	the plan or authorization.				
16	(Provide a) description of any groundwater basin or basins from which the urban water supplier pumps groundwater.	10631(b)(2)	Water Supply		Section 4.2
17	For those basins for which a court or the board has adjudicated the rights to pump groundwater, (provide) a copy of the order or decree adopted by the court or the board	10631(b)(2)	Water Supply		Section 4.2.3 Appendix G
18	(Provide) a description of the amount of groundwater the urban water supplier has the legal right to pump under the order or decree.	10631(b)(2)	Water Supply		Section 4.2.3
19	For basins that have not been adjudicated, (provide) information as to whether the department has identified the basin or basins as overdrafted or has projected that the basin will become overdrafted if present management conditions continue, in the most current official departmental bulletin that characterizes the condition of the groundwater basin, and a detailed description of the efforts being undertaken by the urban water supplier to eliminate the long-term overdraft condition.	10631(b)(2)	Water Supply		Section 4.0 Section 5.2 Figure 5-4 Appendix F
20	(Provide a) detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.	10631(b)(3)	Water Supply		Section 4.2.2
21	(Provide a) detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the urban water supplier. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.	10631(b)(4)	Water Supply	Provide projections for 2015, 2020, 2025, and 2030.	Section 4.1
22	Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage, to the extent practicable, and provide data for each of the following: (A) An average water year, (B) A single dry water year, (C) Multiple dry water years.	10631(c)(1)	Reliability		Section 5.1 Table 5-2
23	For any water source that may not be available at a consistent level of use - given specific legal, environmental, water quality, or climatic factors - describe plans to supplement or replace that source with alternative sources or water demand	10631(c)(2)	Reliability		Section 5.1

Source: 2010 UWMP Guidebook DRAFT 21-

No.	UWMP requirement [a]	Calif. Water Code reference	Subject [b]	Additional clarification	UWMP location
	management measures, to the extent practicable.				
24	Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.	10631(d)	Water Supply (Transfers)		Section 4.4
25	Quantify, to the extent records are available, past and current water use, and projected water use (over the same five-year increments described in subdivision (a)), identifying the uses among water use sectors, including, but not necessarily limited to, all of the following uses: (A) Single-family residential; (B) Multifamily; (C) Commercial; (D) Industrial; (E) Institutional and governmental; (F) Landscape; (G) Sales to other agencies; (H) Saline water intrusion barriers, groundwater recharge, or conjunctive use, or any combination thereof;(I) Agricultural.	10631(e)(1)	Water Demands	Consider “past” to be 2005, present to be 2010, and projected to be 2015, 2020, 2025, and 2030. Provide numbers for each category for each of these years.	Section 3.1.1 Table 3-8
26	(Describe and provide a schedule of implementation for) each water demand management measure that is currently being implemented, or scheduled for implementation, including the steps necessary to implement any proposed measures, including, but not limited to, all of the following: (A) Water survey programs for single-family residential and multifamily residential customers; (B) Residential plumbing retrofit; (C) System water audits, leak detection, and repair; (D) Metering with commodity rates for all new connections and retrofit of existing connections; (E) Large landscape conservation programs and incentives; (F) High-efficiency washing machine rebate programs; (G) Public information programs; (H) School education programs; (I) Conservation programs for commercial, industrial, and institutional accounts; (J) Wholesale agency programs; (K) Conservation pricing; (L) Water conservation coordinator; (M) Water waste prohibition;(N) Residential ultra-low-flush toilet replacement programs.	10631(f)(1)	DMMs	Discuss each DMM, even if it is not currently or planned for implementation. Provide any appropriate schedules.	Section 6.0
27	A description of the methods, if any, that the supplier will use to evaluate the effectiveness of water demand management measures implemented or described under the plan.	10631(f)(3)	DMMs		Section 6.0
28	An estimate, if available, of existing conservation savings on water use within the supplier's service area, and the effect of	10631(f)(4)	DMMs		Section 6.0

Source: 2010 UWMP Guidebook DRAFT 21-

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No.	UWMP requirement [a]	Calif. Water Code reference	Subject [b]	Additional clarification	UWMP location
	the savings on the supplier's ability to further reduce demand.				
29	An evaluation of each water demand management measure listed in paragraph (1) of subdivision (f) that is not currently being implemented or scheduled for implementation. In the course of the evaluation, first consideration shall be given to water demand management measures, or combination of measures, that offer lower incremental costs than expanded or additional water supplies. This evaluation shall do all of the following: (1) Take into account economic and noneconomic factors, including environmental, social, health, customer impact, and technological factors; (2) Include a cost-benefit analysis, identifying total benefits and total costs; (3) Include a description of funding available to implement any planned water supply project that would provide water at a higher unit cost; (4) Include a description of the water supplier's legal authority to implement the measure and efforts to work with other relevant agencies to ensure the implementation of the measure and to share the cost of implementation.	10631(g)	DMMs	See 10631(g) for additional wording.	Section 6.0
30	(Describe) all water supply projects and water supply programs that may be undertaken by the urban water supplier to meet the total projected water use as established pursuant to subdivision (a) of Section 10635. The urban water supplier shall include a detailed description of expected future projects and programs, other than the demand management programs identified pursuant to paragraph (1) of subdivision (f), that the urban water supplier may implement to increase the amount of the water supply available to the urban water supplier in average, single-dry, and multiple-dry water years. The description shall identify specific projects and include a description of the increase in water supply that is expected to be available from each project. The description shall include an estimate with regard to the implementation timeline for each project or program.	10631(h)	Water Supply		Section 3.3.1 Section 4.0
31	Describe the opportunities for development of desalinated water, including, but not limited to, ocean water, brackish water, and groundwater, as a long-term supply.	10631(i)	Water Supply		Section 4.5

Source: 2010 UWMP Guidebook DRAFT 21-

No.	UWMP requirement [a]	Calif. Water Code reference	Subject [b]	Additional clarification	UWMP location
32	Include the annual reports submitted to meet the Section 6.2 requirement (of the MOU), if a member of the CUWCC and signer of the December 10, 2008 MOU.	10631(j)	DMMs	Signers of the MOU that submit the biannual reports are deemed compliant with Items 28 and 29.	Section 6.1
33	Urban water suppliers that rely upon a wholesale agency for a source of water shall provide the wholesale agency with water use projections from that agency for that source of water in five-year increments to 20 years or as far as data is available. The wholesale agency shall provide information to the urban water supplier for inclusion in the urban water supplier's plan that identifies and quantifies, to the extent practicable, the existing and planned sources of water as required by subdivision (b), available from the wholesale agency to the urban water supplier over the same five-year increments, and during various water-year types in accordance with subdivision (c). An urban water supplier may rely upon water supply information provided by the wholesale agency in fulfilling the plan informational requirements of subdivisions (b) and (c).	10631(k)	Water Supply	Average year, single dry year, multiple dry years for 2015, 2020, 2025, and 2030. Tables 5-2 through 5-4	Section 5.1 Section 4.9
34	The water use projections required by Section 10631 shall include projected water use for single-family and multifamily residential housing needed for lower income households, as defined in Section 50079.5 of the Health and Safety Code, as identified in the housing element of any city, county, or city and county in the service area of the supplier.	10631.1(a)	Water Demands		Section 3.1.2.1
35	Stages of action to be undertaken by the urban water supplier in response to water supply shortages, including up to a 50 percent reduction in water supply, and an outline of specific water supply conditions which are applicable to each stage.	10632(a)	Contingency		Section 5.7
36	Provide an estimate of the minimum water supply available during each of the next three water years based on the driest three-year historic sequence for the agency's water supply.	10632(b)	Contingency		Section 5.4
37	(Identify) actions to be undertaken by the urban water supplier to prepare for, and implement during, a catastrophic interruption of water supplies including, but not limited to, a	10632(c)	Contingency		Section 5.5

Source: 2010 UWMP Guidebook DRAFT 21-

No.	UWMP requirement [a]	Calif. Water Code reference	Subject [b]	Additional clarification	UWMP location
	regional power outage, an earthquake, or other disaster.				
38	(Identify) additional, mandatory prohibitions against specific water use practices during water shortages, including, but not limited to, prohibiting the use of potable water for street cleaning.	10632(d)	Contingency		Section 5.6
39	(Specify) consumption reduction methods in the most restrictive stages. Each urban water supplier may use any type of consumption reduction methods in its water shortage contingency analysis that would reduce water use, are appropriate for its area, and have the ability to achieve a water use reduction consistent with up to a 50 percent reduction in water supply.	10632(e)	Contingency		Section 5.6
40	(Indicated) penalties or charges for excessive use, where applicable.	10632(f)	Contingency		Section 5.7
41	An analysis of the impacts of each of the actions and conditions described in subdivisions (a) to (f), inclusive, on the revenues and expenditures of the urban water supplier, and proposed measures to overcome those impacts, such as the development of reserves and rate adjustments.	10632(g)	Contingency		Section 5.8
42	(Provide) a draft water shortage contingency resolution or ordinance.	10632(h)	Contingency		Section 5.5 Appendix I
43	(Indicate) a mechanism for determining actual reductions in water use pursuant to the urban water shortage contingency analysis.	10632(i)	Contingency		Section 5.6.5
44	Provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. The preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area	10633	Recycled Water		Section 4.6.1
45	(Describe) the wastewater collection and treatment systems in the supplier's service area, including a quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.	10633(a)	Recycled Water		Section 4.6
46	(Describe) the quantity of treated wastewater that meets recycled water standards, is being discharged, and is	10633(b)	Recycled Water		Section 4.6

Source: 2010 UWMP Guidebook DRAFT 21-

No.	UWMP requirement [a]	Calif. Water Code reference	Subject [b]	Additional clarification	UWMP location
	otherwise available for use in a recycled water project.				
47	(Describe) the recycled water currently being used in the supplier's service area, including, but not limited to, the type, place, and quantity of use.	10633(c)	Recycled Water		Section 4.6
48	(Describe and quantify) the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, indirect potable reuse, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.	10633(d)	Recycled Water		Section 4.6.1
49	(Describe) The projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected pursuant to this subdivision.	10633(e)	Recycled Water		Section 4.6.2
50	(Describe the) actions, including financial incentives, which may be taken to encourage the use of recycled water, and the projected results of these actions in terms of acre-feet of recycled water used per year.	10633(f)	Recycled Water		Section 4.7.2
51	(Provide a) plan for optimizing the use of recycled water in the supplier's service area, including actions to facilitate the installation of dual distribution systems, to promote recirculating uses, to facilitate the increased use of treated wastewater that meets recycled water standards, and to overcome any obstacles to achieving that increased use.	10633(g)	Recycled Water		Section 4.6.2
52	The plan shall include information, to the extent practicable, relating to the quality of existing sources of water available to the supplier over the same five-year increments as described in subdivision (a) of Section 10631, and the manner in which water quality affects water management strategies and supply reliability.	10634	Water Supply (Water Quality)	For years 2010, 2015, 2020, 2025, and 2030	Section 5.9
53	Every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry water years. This water supply and demand assessment shall compare the total water supply sources available to the	10635(a)	Reliability		Section 5.12

Source: 2010 UWMP Guidebook DRAFT 21-

No.	UWMP requirement [a]	Calif. Water Code reference	Subject [b]	Additional clarification	UWMP location
	water supplier with the total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and multiple dry water years. The water service reliability assessment shall be based upon the information compiled pursuant to Section 10631, including available data from state, regional, or local agency population projections within the service area of the urban water supplier.				
54	The urban water supplier shall provide that portion of its urban water management plan prepared pursuant to this article to any city or county within which it provides water supplies no later than 60 days after the submission of its urban water management plan.	10635(b)	External Coordination and Outreach		Section 1.2.3
55	Each urban water supplier shall encourage the active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan.	10642	External Coordination and Outreach		Section 1.2.1, 1.2.2 and 1.2.3
56	Prior to adopting a plan, the urban water supplier shall make the plan available for public inspection and shall hold a public hearing thereon. Prior to the hearing, notice of the time and place of hearing shall be published within the jurisdiction of the publicly owned water supplier pursuant to Section 6066 of the Government Code. The urban water supplier shall provide notice of the time and place of hearing to any city or county within which the supplier provides water supplies. A privately owned water supplier shall provide an equivalent notice within its service area.	10642	External Coordination and Outreach		Section 1.2.2 Appendix B
57	After the hearing, the plan shall be adopted as prepared or as modified after the hearing.	10642	External Coordination and Outreach		Section 1.2.2 Appendix B
58	An urban water supplier shall implement its plan adopted pursuant to this chapter in accordance with the schedule set forth in its plan.	10643	External Coordination and Outreach		Section 1.3.1
59	An urban water supplier shall submit to the department, the California State Library, and any city or county within which the supplier provides water supplies a copy of its plan no later than 30 days after adoption. Copies of amendments or	10644(a)	External Coordination and Outreach		Section 1.3.1 Appendix B

Source: 2010 UWMP Guidebook DRAFT 21-

No.	UWMP requirement [a]	Calif. Water Code reference	Subject [b]	Additional clarification	UWMP location
	changes to the plans shall be submitted to the department, the California State Library, and any city or county within which the supplier provides water supplies within 30 days after adoption.				
60	Not later than 30 days after filing a copy of its plan with the department, the urban water supplier and the department shall make the plan available for public review during normal business hours.	10645	External Coordination and Outreach		Section 1.3.1

a The UWMP Requirement descriptions are general summaries of what is provided in the legislation. Urban water suppliers should review the exact legislative wording prior to submitting its UWMP.

b The Subject classification is provided for clarification only. A water supplier is free to address the UWMP Requirement anywhere with its UWMP, but is urged to provide clarification to DWR to facilitate review for completeness.

Source: 2010 UWMP Guidebook DRAFT 21-

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APPENDICES

GEOSCIENCE

APPENDIX A

Urban Water Management Planning Act

And Senate Bill No. 7

GEOSCIENCE

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

All California Codes have been updated to include the 2010 Statutes.

WATER CODE
SECTION 10610-10610.4

10610. This part shall be known and may be cited as the "Urban Water Management Planning Act."

10610.2. (a) The Legislature finds and declares all of the following:

(1) The waters of the state are a limited and renewable resource subject to ever-increasing demands.

(2) The conservation and efficient use of urban water supplies are of statewide concern; however, the planning for that use and the implementation of those plans can best be accomplished at the local level.

(3) A long-term, reliable supply of water is essential to protect the productivity of California's businesses and economic climate.

(4) As part of its long-range planning activities, every urban water supplier should make every effort to ensure the appropriate level of reliability in its water service sufficient to meet the needs of its various categories of customers during normal, dry, and multiple dry water years.

(5) Public health issues have been raised over a number of contaminants that have been identified in certain local and imported water supplies.

(6) Implementing effective water management strategies, including groundwater storage projects and recycled water projects, may require specific water quality and salinity targets for meeting groundwater basins water quality objectives and promoting beneficial use of recycled water.

(7) Water quality regulations are becoming an increasingly important factor in water agencies' selection of raw water sources, treatment alternatives, and modifications to existing treatment facilities.

(8) Changes in drinking water quality standards may also impact the usefulness of water supplies and may ultimately impact supply reliability.

(9) The quality of source supplies can have a significant impact

on water management strategies and supply reliability.
(b) This part is intended to provide assistance to water agencies in carrying out their long-term resource planning responsibilities to ensure adequate water supplies to meet existing and future demands for water.

10610.4. The Legislature finds and declares that it is the policy of the state as follows:
(a) The management of urban water demands and efficient use of water shall be actively pursued to protect both the people of the state and their water resources.
(b) The management of urban water demands and efficient use of urban water supplies shall be a guiding criterion in public decisions.
(c) Urban water suppliers shall be required to develop water management plans to actively pursue the efficient use of available supplies.

WATER CODE
SECTION 10611-10617

10611. Unless the context otherwise requires, the definitions of this chapter govern the construction of this part.

10611.5. "Demand management" means those water conservation measures, programs, and incentives that prevent the waste of water and promote the reasonable and efficient use and reuse of available supplies.

10612. "Customer" means a purchaser of water from a water supplier who uses the water for municipal purposes, including residential, commercial, governmental, and industrial uses.

10613. "Efficient use" means those management measures that result in the most effective use of water so as to prevent its waste or unreasonable use or unreasonable method of use.

10614. "Person" means any individual, firm, association, organization, partnership, business, trust, corporation, company, public agency, or any agency of such an entity.

10615. "Plan" means an urban water management plan prepared pursuant to this part. A plan shall describe and evaluate sources of supply, reasonable and practical efficient uses, reclamation and demand management activities. The components of the plan may vary according to an individual community or area's characteristics and its capabilities to efficiently use and conserve water. The plan shall address measures for residential, commercial, governmental, and industrial water demand management as set forth in Article 2 (commencing with Section 10630) of Chapter 3. In addition, a strategy and time schedule for implementation shall be included in the plan.

10616. "Public agency" means any board, commission, county, city and county, city, regional agency, district, or other public entity.

10616.5. "Recycled water" means the reclamation and reuse of wastewater for beneficial use.

10617. "Urban water supplier" means a supplier, either publicly or privately owned, providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually. An urban water supplier includes a supplier or contractor for water, regardless of the basis of right, which distributes or sells for ultimate resale to customers. This part applies only to water supplied from public water systems subject to Chapter 4 (commencing with Section 116275) of Part 12 of Division 104 of the Health and Safety Code.

WATER CODE
SECTION 10620-10621

10620. (a) Every urban water supplier shall prepare and adopt an urban water management plan in the manner set forth in Article 3 (commencing with Section 10640).

(b) Every person that becomes an urban water supplier shall adopt an urban water management plan within one year after it has become an urban water supplier.

(c) An urban water supplier indirectly providing water shall not include planning elements in its water management plan as provided in Article 2 (commencing with Section 10630) that would be applicable to urban water suppliers or public agencies directly providing water, or to their customers, without the consent of those suppliers or public agencies.

(d) (1) An urban water supplier may satisfy the requirements of this part by participation in areawide, regional, watershed, or basinwide urban water management planning where those plans will reduce preparation costs and contribute to the achievement of conservation and efficient water use.

(2) Each urban water supplier shall coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.

(e) The urban water supplier may prepare the plan with its own staff, by contract, or in cooperation with other governmental agencies.

(f) An urban water supplier shall describe in the plan water management tools and options used by that entity that will maximize resources and minimize the need to import water from other regions.

10621. (a) Each urban water supplier shall update its plan at least once every five years on or before December 31, in years ending in five and zero.

(b) Every urban water supplier required to prepare a plan pursuant to this part shall, at least 60 days prior to the public hearing on the plan required by Section 10642, notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. The urban water supplier may consult with, and obtain comments from, any city or county that receives notice pursuant to this subdivision.

(c) The amendments to, or changes in, the plan shall be adopted and filed in the manner set forth in Article 3 (commencing with Section 10640).

WATER CODE
SECTION 10630-10634

10630. It is the intention of the Legislature, in enacting this part, to permit levels of water management planning commensurate with the numbers of customers served and the volume of water supplied.

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

(a) Describe the service area of the supplier, including current and projected population, climate, and other demographic factors affecting the supplier's water management planning. The projected population estimates shall be based upon data from the state, regional, or local service agency population projections within the service area of the urban water supplier and shall be in five-year increments to 20 years or as far as data is available.

(b) Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision (a). If groundwater is identified as an existing or planned source of water available to the supplier, all of the following information shall be included in the plan:

(1) A copy of any groundwater management plan adopted by the urban water supplier, including plans adopted pursuant to Part 2.75 (commencing with Section 10750), or any other specific authorization for groundwater management.

(2) A description of any groundwater basin or basins from which the urban water supplier pumps groundwater. For those basins for which a court or the board has adjudicated the rights to pump groundwater, a copy of the order or decree adopted by the court or the board and a description of the amount of groundwater the urban water supplier has the legal right to pump under the order or decree. For basins that have not been adjudicated, information as to whether the department has identified the basin or basins as overdrafted or has projected that the basin will become overdrafted if present management conditions continue, in the most current official departmental bulletin that characterizes the condition of the groundwater basin, and a detailed description of the efforts being undertaken by the urban water supplier to eliminate the long-term overdraft condition.

(3) A detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

(4) A detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the urban water supplier. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

(c) (1) Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage, to the extent practicable, and provide data for each of the following:

(A) An average water year.

(B) A single dry water year.

(C) Multiple dry water years.

(2) For any water source that may not be available at a consistent level of use, given specific legal, environmental, water quality, or climatic factors, describe plans to supplement or replace that source with alternative sources or water demand management measures, to the extent practicable.

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

(e) (1) Quantify, to the extent records are available, past and current water use, over the same five-year increments described in subdivision (a), and projected water use, identifying the uses among water use sectors, including, but not necessarily limited to, all of the following uses:

(A) Single-family residential.

(B) Multifamily.

(C) Commercial.

(D) Industrial.

(E) Institutional and governmental.

(F) Landscape.

(G) Sales to other agencies.

(H) Saline water intrusion barriers, groundwater recharge, or conjunctive use, or any combination thereof.

(I) Agricultural.

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

(f) Provide a description of the supplier's water demand management measures. This description shall include all of the following:

(1) A description of each water demand management measure that is currently being implemented, or scheduled for implementation, including the steps necessary to implement any proposed measures, including, but not limited to, all of the following:

(A) Water survey programs for single-family residential and multifamily residential customers.

(B) Residential plumbing retrofit.

(C) System water audits, leak detection, and repair.

(D) Metering with commodity rates for all new connections and retrofit of existing connections.

(E) Large landscape conservation programs and incentives.

(F) High-efficiency washing machine rebate programs.

(G) Public information programs.

(H) School education programs.

(I) Conservation programs for commercial, industrial, and institutional accounts.

(J) Wholesale agency programs.
(K) Conservation pricing.
(L) Water conservation coordinator.
(M) Water waste prohibition.
(N) Residential ultra-low-flush toilet replacement programs.

(2) A schedule of implementation for all water demand management measures proposed or described in the plan.

(3) A description of the methods, if any, that the supplier will use to evaluate the effectiveness of water demand management measures implemented or described under the plan.

(4) An estimate, if available, of existing conservation savings on water use within the supplier's service area, and the effect of the savings on the supplier's ability to further reduce demand.

(g) An evaluation of each water demand management measure listed in paragraph (1) of subdivision (f) that is not currently being implemented or scheduled for implementation. In the course of the evaluation, first consideration shall be given to water demand management measures, or combination of measures, that offer lower incremental costs than expanded or additional water supplies. This evaluation shall do all of the following:

(1) Take into account economic and noneconomic factors, including environmental, social, health, customer impact, and technological factors.

(2) Include a cost-benefit analysis, identifying total benefits and total costs.

(3) Include a description of funding available to implement any planned water supply project that would provide water at a higher unit cost.

(4) Include a description of the water supplier's legal authority to implement the measure and efforts to work with other relevant agencies to ensure the implementation of the measure and to share the cost of implementation.

(h) Include a description of all water supply projects and water supply programs that may be undertaken by the urban water supplier to meet the total projected water use as established pursuant to subdivision (a) of Section 10635. The urban water supplier shall include a detailed description of expected future projects and programs, other than the demand management programs identified pursuant to paragraph (1) of subdivision (f), that the urban water supplier may implement to increase the amount of the water supply available to the urban water supplier in average, single-dry, and multiple-dry water years. The description shall identify specific projects and include a description of the increase in water supply that is expected to be available from each project. The description shall include an estimate with regard to the implementation timeline for each project or program.

(i) Describe the opportunities for development of desalinated water, including, but not limited to, ocean water, brackish water, and groundwater, as a long-term supply.

(j) For purposes of this part, urban water suppliers that are members of the California Urban Water Conservation Council shall be deemed in compliance with the requirements of subdivisions (f) and (g) by complying with all the provisions of the "Memorandum of Understanding Regarding Urban Water Conservation in California," dated December 10, 2008, as it may be amended, and by submitting the annual reports required by Section 6.2 of that memorandum.

(k) Urban water suppliers that rely upon a wholesale agency for a source of water shall provide the wholesale agency with water use projections from that agency for that source of water in five-year increments to 20 years or as far as data is available. The wholesale agency shall provide information to the urban water supplier for inclusion in the urban water supplier's plan that identifies and quantifies, to the extent practicable, the existing and planned sources of water as required by subdivision (b), available from the wholesale agency to the urban water supplier over the same five-year increments, and during various water-year types in accordance with subdivision (c). An urban water supplier may rely upon water supply information provided by the wholesale agency in fulfilling the plan informational requirements of subdivisions (b) and (c).

10631.1. (a) The water use projections required by Section 10631 shall include projected water use for single-family and multifamily residential housing needed for lower income households, as defined in Section 50079.5 of the Health and Safety Code, as identified in the housing element of any city, county, or city and county in the service area of the supplier.

(b) It is the intent of the Legislature that the identification of projected water use for single-family and multifamily residential housing for lower income households will assist a supplier in complying with the requirement under Section 65589.7 of the Government Code to grant a priority for the provision of service to housing units affordable to lower income households.

10631.5. (a) (1) Beginning January 1, 2009, the terms of, and eligibility for, a water management grant or loan made to an urban water supplier and awarded or administered by the department, state board, or California Bay-Delta Authority or its successor agency shall be conditioned on the implementation of the water demand management measures described in Section 10631, as determined by the department pursuant to subdivision (b).

(2) For the purposes of this section, water management grants and loans include funding for programs and projects for surface water or groundwater storage, recycling, desalination, water conservation, water supply reliability, and water supply augmentation. This section does not apply to water management projects funded by the federal American Recovery and Reinvestment Act of 2009 (Public Law 111-5).

(3) Notwithstanding paragraph (1), the department shall determine that an urban water supplier is eligible for a water management grant or loan even though the supplier is not implementing all of the water demand management measures described in Section 10631, if the urban water supplier has submitted to the department for approval a schedule, financing plan, and budget, to be included in the grant or loan agreement, for implementation of the water demand management measures. The supplier may request grant or loan funds to implement the water demand management measures to the extent the request is consistent with the eligibility requirements applicable to the water management funds.

(4) (A) Notwithstanding paragraph (1), the department shall

determine that an urban water supplier is eligible for a water management grant or loan even though the supplier is not implementing all of the water demand management measures described in Section 10631, if an urban water supplier submits to the department for approval documentation demonstrating that a water demand management measure is not locally cost effective. If the department determines that the documentation submitted by the urban water supplier fails to demonstrate that a water demand management measure is not locally cost effective, the department shall notify the urban water supplier and the agency administering the grant or loan program within 120 days that the documentation does not satisfy the requirements for an exemption, and include in that notification a detailed statement to support the determination.

(B) For purposes of this paragraph, "not locally cost effective" means that the present value of the local benefits of implementing a water demand management measure is less than the present value of the local costs of implementing that measure.

(b) (1) The department, in consultation with the state board and the California Bay-Delta Authority or its successor agency, and after soliciting public comment regarding eligibility requirements, shall develop eligibility requirements to implement the requirement of paragraph (1) of subdivision (a). In establishing these eligibility requirements, the department shall do both of the following:

(A) Consider the conservation measures described in the Memorandum of Understanding Regarding Urban Water Conservation in California, and alternative conservation approaches that provide equal or greater water savings.

(B) Recognize the different legal, technical, fiscal, and practical roles and responsibilities of wholesale water suppliers and retail water suppliers.

(2) (A) For the purposes of this section, the department shall determine whether an urban water supplier is implementing all of the water demand management measures described in Section 10631 based on either, or a combination, of the following:

(i) Compliance on an individual basis.

(ii) Compliance on a regional basis. Regional compliance shall require participation in a regional conservation program consisting of two or more urban water suppliers that achieves the level of conservation or water efficiency savings equivalent to the amount of conservation or savings achieved if each of the participating urban water suppliers implemented the water demand management measures. The urban water supplier administering the regional program shall provide participating urban water suppliers and the department with data to demonstrate that the regional program is consistent with this clause. The department shall review the data to determine whether the urban water suppliers in the regional program are meeting the eligibility requirements.

(B) The department may require additional information for any determination pursuant to this section.

(3) The department shall not deny eligibility to an urban water supplier in compliance with the requirements of this section that is participating in a multiagency water project, or an integrated regional water management plan, developed pursuant to Section 75026 of the Public Resources Code, solely on the basis that one or more of

the agencies participating in the project or plan is not implementing all of the water demand management measures described in Section 10631.

(c) In establishing guidelines pursuant to the specific funding authorization for any water management grant or loan program subject to this section, the agency administering the grant or loan program shall include in the guidelines the eligibility requirements developed by the department pursuant to subdivision (b).

(d) Upon receipt of a water management grant or loan application by an agency administering a grant and loan program subject to this section, the agency shall request an eligibility determination from the department with respect to the requirements of this section. The department shall respond to the request within 60 days of the request.

(e) The urban water supplier may submit to the department copies of its annual reports and other relevant documents to assist the department in determining whether the urban water supplier is implementing or scheduling the implementation of water demand management activities. In addition, for urban water suppliers that are signatories to the Memorandum of Understanding Regarding Urban Water Conservation in California and submit biennial reports to the California Urban Water Conservation Council in accordance with the memorandum, the department may use these reports to assist in tracking the implementation of water demand management measures.

(f) This section shall remain in effect only until July 1, 2016, and as of that date is repealed, unless a later enacted statute, that is enacted before July 1, 2016, deletes or extends that date.

10631.7. The department, in consultation with the California Urban Water Conservation Council, shall convene an independent technical panel to provide information and recommendations to the department and the Legislature on new demand management measures, technologies, and approaches. The panel shall consist of no more than seven members, who shall be selected by the department to reflect a balanced representation of experts. The panel shall have at least one, but no more than two, representatives from each of the following: retail water suppliers, environmental organizations, the business community, wholesale water suppliers, and academia. The panel shall be convened by January 1, 2009, and shall report to the Legislature no later than January 1, 2010, and every five years thereafter. The department shall review the panel report and include in the final report to the Legislature the department's recommendations and comments regarding the panel process and the panel's recommendations.

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

(1) Stages of action to be undertaken by the urban water supplier in response to water supply shortages, including up to a 50 percent reduction in water supply, and an outline of specific water supply conditions that are applicable to each stage.

(2) 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.

(3) Actions to be undertaken by the urban water supplier to prepare for, and implement during, a catastrophic interruption of water supplies including, but not limited to, a regional power outage, an earthquake, or other disaster.

(4) Additional, mandatory prohibitions against specific water use practices during water shortages, including, but not limited to, prohibiting the use of potable water for street cleaning.

(5) Consumption reduction methods in the most restrictive stages. Each urban water supplier may use any type of consumption reduction methods in its water shortage contingency analysis that would reduce water use, are appropriate for its area, and have the ability to achieve a water use reduction consistent with up to a 50 percent reduction in water supply.

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

(7) An analysis of the impacts of each of the actions and conditions described in paragraphs (1) to (6), inclusive, on the revenues and expenditures of the urban water supplier, and proposed measures to overcome those impacts, such as the development of reserves and rate adjustments.

(8) A draft water shortage contingency resolution or ordinance.

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

(b) Commencing with the urban water management plan update due December 31, 2015, for purposes of developing the water shortage contingency analysis pursuant to subdivision (a), the urban water supplier shall analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas, as defined in subdivision (a) of Section 115921 of the Health and Safety Code.

10633. The plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. The preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area, and shall include all of the following:

(a) A description of the wastewater collection and treatment systems in the supplier's service area, including a quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.

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

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

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

(e) The projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected pursuant to this subdivision.

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

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

10634. The plan shall include information, to the extent practicable, relating to the quality of existing sources of water available to the supplier over the same five-year increments as described in subdivision (a) of Section 10631, and the manner in which water quality affects water management strategies and supply reliability.

WATER CODE
SECTION 10635

10635. (a) Every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry water years. This water supply and demand assessment shall compare the total water supply sources available to the water supplier with the total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and multiple dry water years. The water service reliability assessment shall be based upon the information compiled pursuant to Section 10631, including available data from state, regional, or local agency population projections within the service area of the urban water supplier.

(b) The urban water supplier shall provide that portion of its urban water management plan prepared pursuant to this article to any city or county within which it provides water supplies no later than 60 days after the submission of its urban water management plan.

(c) Nothing in this article is intended to create a right or entitlement to water service or any specific level of water service.

(d) Nothing in this article is intended to change existing law concerning an urban water supplier's obligation to provide water service to its existing customers or to any potential future customers.

WATER CODE
SECTION 10640-10645

10640. Every urban water supplier required to prepare a plan pursuant to this part shall prepare its plan pursuant to Article 2 (commencing with Section 10630).

The supplier shall likewise periodically review the plan as required by Section 10621, and any amendments or changes required as a result of that review shall be adopted pursuant to this article.

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

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

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

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

(b) The department shall prepare and submit to the Legislature, on or before December 31, in the years ending in six and one, a report summarizing the status of the plans adopted pursuant to this part. The report prepared by the department shall identify the exemplary elements of the individual plans. The department shall provide a copy of the report to each urban water supplier that has submitted its plan to the department. The department shall also prepare reports and provide data for any legislative hearings designed to consider the effectiveness of plans submitted pursuant to this part.

(c) (1) For the purpose of identifying the exemplary elements of the individual plans, the department shall identify in the report those water demand management measures adopted and implemented by specific urban water suppliers, and identified pursuant to Section

10631, that achieve water savings significantly above the levels established by the department to meet the requirements of Section 10631.5.

(2) The department shall distribute to the panel convened pursuant to Section 10631.7 the results achieved by the implementation of those water demand management measures described in paragraph (1).

(3) The department shall make available to the public the standard the department will use to identify exemplary water demand management measures.

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

WATER CODE
SECTION 10650-10656

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

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

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

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

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

10653. The adoption of a plan shall satisfy any requirements of state law, regulation, or order, including those of the State Water Resources Control Board and the Public Utilities Commission, for the preparation of water management plans or conservation plans; provided, that if the State Water Resources Control Board or the Public Utilities Commission requires additional information concerning water conservation to implement its existing authority, nothing in this part shall be deemed to limit the board or the commission in obtaining that information. The requirements of this part shall be satisfied by any urban water demand management plan prepared to meet federal laws or regulations after the effective date of this part, and which substantially meets the requirements of this part, or by any existing urban water management plan which includes the contents of a plan required under this part.

10654. An urban water supplier may recover in its rates the costs incurred in preparing its plan and implementing the reasonable water conservation measures included in the plan. Any best water management practice that is included in the plan that is identified in the

"Memorandum of Understanding Regarding Urban Water Conservation in California" is deemed to be reasonable for the purposes of this section.

10655. If any provision of this part or the application thereof to any person or circumstances is held invalid, that invalidity shall not affect other provisions or applications of this part which can be given effect without the invalid provision or application thereof, and to this end the provisions of this part are severable.

10656. An urban water supplier that does not prepare, adopt, and submit its urban water management plan to the department in accordance with this part, is ineligible to receive funding pursuant to Division 24 (commencing with Section 78500) or Division 26 (commencing with Section 79000), or receive drought assistance from the state until the urban water management plan is submitted pursuant to this article.

Senate Bill No. 7

CHAPTER 4

An act to amend and repeal Section 10631.5 of, to add Part 2.55 (commencing with Section 10608) to Division 6 of, and to repeal and add Part 2.8 (commencing with Section 10800) of Division 6 of, the Water Code, relating to water.

[Approved by Governor November 10, 2009. Filed with Secretary of State November 10, 2009.]

LEGISLATIVE COUNSEL'S DIGEST

SB 7, Steinberg. Water conservation.

(1) Existing law requires the Department of Water Resources to convene an independent technical panel to provide information to the department and the Legislature on new demand management measures, technologies, and approaches. "Demand management measures" means those water conservation measures, programs, and incentives that prevent the waste of water and promote the reasonable and efficient use and reuse of available supplies.

This bill would require the state to achieve a 20% reduction in urban per capita water use in California by December 31, 2020. The state would be required to make incremental progress towards this goal by reducing per capita water use by at least 10% on or before December 31, 2015. The bill would require each urban retail water supplier to develop urban water use targets and an interim urban water use target, in accordance with specified requirements. The bill would require agricultural water suppliers to implement efficient water management practices. The bill would require the department, in consultation with other state agencies, to develop a single standardized water use reporting form. The bill, with certain exceptions, would provide that urban retail water suppliers, on and after July 1, 2016, and agricultural water suppliers, on and after July 1, 2013, are not eligible for state water grants or loans unless they comply with the water conservation requirements established by the bill. The bill would repeal, on July 1, 2016, an existing requirement that conditions eligibility for certain water management grants or loans to an urban water supplier on the implementation of certain water demand management measures.

(2) Existing law, until January 1, 1993, and thereafter only as specified, requires certain agricultural water suppliers to prepare and adopt water management plans.

This bill would revise existing law relating to agricultural water management planning to require agricultural water suppliers to prepare and adopt agricultural water management plans with specified components on or before December 31, 2012, and update those plans on or before December

31, 2015, and on or before December 31 every 5 years thereafter. An agricultural water supplier that becomes an agricultural water supplier after December 31, 2012, would be required to prepare and adopt an agricultural water management plan within one year after becoming an agricultural water supplier. The agricultural water supplier would be required to notify each city or county within which the supplier provides water supplies with regard to the preparation or review of the plan. The bill would require the agricultural water supplier to submit copies of the plan to the department and other specified entities. The bill would provide that an agricultural water supplier is not eligible for state water grants or loans unless the supplier complies with the water management planning requirements established by the bill.

(3) The bill would take effect only if SB 1 and SB 6 of the 2009–10 7th Extraordinary Session of the Legislature are enacted and become effective.

The people of the State of California do enact as follows:

SECTION 1. Part 2.55 (commencing with Section 10608) is added to Division 6 of the Water Code, to read:

PART 2.55. SUSTAINABLE WATER USE AND DEMAND REDUCTION

Chapter 1. General Declarations and Policy

10608. The Legislature finds and declares all of the following:

(a) Water is a public resource that the California Constitution protects against waste and unreasonable use.

(b) Growing population, climate change, and the need to protect and grow California's economy while protecting and restoring our fish and wildlife habitats make it essential that the state manage its water resources as efficiently as possible.

(c) Diverse regional water supply portfolios will increase water supply reliability and reduce dependence on the Delta.

(d) Reduced water use through conservation provides significant energy and environmental benefits, and can help protect water quality, improve streamflows, and reduce greenhouse gas emissions.

(e) The success of state and local water conservation programs to increase efficiency of water use is best determined on the basis of measurable outcomes related to water use or efficiency.

(f) Improvements in technology and management practices offer the potential for increasing water efficiency in California over time, providing an essential water management tool to meet the need for water for urban, agricultural, and environmental uses.

(g) The Governor has called for a 20 percent per capita reduction in urban water use statewide by 2020.

(h) The factors used to formulate water use efficiency targets can vary significantly from location to location based on factors including weather, patterns of urban and suburban development, and past efforts to enhance water use efficiency.

(i) Per capita water use is a valid measure of a water provider's efforts to reduce urban water use within its service area. However, per capita water use is less useful for measuring relative water use efficiency between different water providers. Differences in weather, historical patterns of urban and suburban development, and density of housing in a particular location need to be considered when assessing per capita water use as a measure of efficiency.

10608.4. It is the intent of the Legislature, by the enactment of this part, to do all of the following:

(a) Require all water suppliers to increase the efficiency of use of this essential resource.

(b) Establish a framework to meet the state targets for urban water conservation identified in this part and called for by the Governor.

(c) Measure increased efficiency of urban water use on a per capita basis.

(d) Establish a method or methods for urban retail water suppliers to determine targets for achieving increased water use efficiency by the year 2020, in accordance with the Governor's goal of a 20-percent reduction.

(e) Establish consistent water use efficiency planning and implementation standards for urban water suppliers and agricultural water suppliers.

(f) Promote urban water conservation standards that are consistent with the California Urban Water Conservation Council's adopted best management practices and the requirements for demand management in Section 10631.

(g) Establish standards that recognize and provide credit to water suppliers that made substantial capital investments in urban water conservation since the drought of the early 1990s.

(h) Recognize and account for the investment of urban retail water suppliers in providing recycled water for beneficial uses.

(i) Require implementation of specified efficient water management practices for agricultural water suppliers.

(j) Support the economic productivity of California's agricultural, commercial, and industrial sectors.

(k) Advance regional water resources management.

10608.8. (a) (1) Water use efficiency measures adopted and implemented pursuant to this part or Part 2.8 (commencing with Section 10800) are water conservation measures subject to the protections provided under Section 1011.

(2) Because an urban agency is not required to meet its urban water use target until 2020 pursuant to subdivision (b) of Section 10608.24, an urban retail water supplier's failure to meet those targets shall not establish a violation of law for purposes of any state administrative or judicial proceeding prior to January 1, 2021. Nothing in this paragraph limits the use of data reported to the department or the board in litigation or an

administrative proceeding. This paragraph shall become inoperative on January 1, 2021.

(3) To the extent feasible, the department and the board shall provide for the use of water conservation reports required under this part to meet the requirements of Section 1011 for water conservation reporting.

(b) This part does not limit or otherwise affect the application of Chapter 3.5 (commencing with Section 11340), Chapter 4 (commencing with Section 11370), Chapter 4.5 (commencing with Section 11400), and Chapter 5 (commencing with Section 11500) of Part 1 of Division 3 of Title 2 of the Government Code.

(c) This part does not require a reduction in the total water used in the agricultural or urban sectors, because other factors, including, but not limited to, changes in agricultural economics or population growth may have greater effects on water use. This part does not limit the economic productivity of California's agricultural, commercial, or industrial sectors.

(d) The requirements of this part do not apply to an agricultural water supplier that is a party to the Quantification Settlement Agreement, as defined in subdivision (a) of Section 1 of Chapter 617 of the Statutes of 2002, during the period within which the Quantification Settlement Agreement remains in effect. After the expiration of the Quantification Settlement Agreement, to the extent conservation water projects implemented as part of the Quantification Settlement Agreement remain in effect, the conserved water created as part of those projects shall be credited against the obligations of the agricultural water supplier pursuant to this part.

Chapter 2. Definitions

10608.12. Unless the context otherwise requires, the following definitions govern the construction of this part:

(a) "Agricultural water supplier" means a water supplier, either publicly or privately owned, providing water to 10,000 or more irrigated acres, excluding recycled water. "Agricultural water supplier" includes a supplier or contractor for water, regardless of the basis of right, that distributes or sells water for ultimate resale to customers. "Agricultural water supplier" does not include the department.

(b) "Base daily per capita water use" means any of the following:

(1) The urban retail water supplier's estimate of its average gross water use, reported in gallons per capita per day and calculated over a continuous 10-year period ending no earlier than December 31, 2004, and no later than December 31, 2010.

(2) For an urban retail water supplier that meets at least 10 percent of its 2008 measured retail water demand through recycled water that is delivered within the service area of an urban retail water supplier or its urban wholesale water supplier, the urban retail water supplier may extend the calculation described in paragraph (1) up to an additional five years to a maximum of

a continuous 15-year period ending no earlier than December 31, 2004, and no later than December 31, 2010.

(3) For the purposes of Section 10608.22, the urban retail water supplier's estimate of its average gross water use, reported in gallons per capita per day and calculated over a continuous five-year period ending no earlier than December 31, 2007, and no later than December 31, 2010.

(c) "Baseline commercial, industrial, and institutional water use" means an urban retail water supplier's base daily per capita water use for commercial, industrial, and institutional users.

(d) "Commercial water user" means a water user that provides or distributes a product or service.

(e) "Compliance daily per capita water use" means the gross water use during the final year of the reporting period, reported in gallons per capita per day.

(f) "Disadvantaged community" means a community with an annual median household income that is less than 80 percent of the statewide annual median household income.

(g) "Gross water use" means the total volume of water, whether treated or untreated, entering the distribution system of an urban retail water supplier, excluding all of the following:

(1) Recycled water that is delivered within the service area of an urban retail water supplier or its urban wholesale water supplier.

(2) The net volume of water that the urban retail water supplier places into long-term storage.

(3) The volume of water the urban retail water supplier conveys for use by another urban water supplier.

(4) The volume of water delivered for agricultural use, except as otherwise provided in subdivision (f) of Section 10608.24.

(h) "Industrial water user" means a water user that is primarily a manufacturer or processor of materials as defined by the North American Industry Classification System code sectors 31 to 33, inclusive, or an entity that is a water user primarily engaged in research and development.

(i) "Institutional water user" means a water user dedicated to public service. This type of user includes, among other users, higher education institutions, schools, courts, churches, hospitals, government facilities, and nonprofit research institutions.

(j) "Interim urban water use target" means the midpoint between the urban retail water supplier's base daily per capita water use and the urban retail water supplier's urban water use target for 2020.

(k) "Locally cost effective" means that the present value of the local benefits of implementing an agricultural efficiency water management practice is greater than or equal to the present value of the local cost of implementing that measure.

(*l*) "Process water" means water used for producing a product or product content or water used for research and development, including, but not limited to, continuous manufacturing processes, water used for testing and maintaining equipment used in producing a product or product content, and water used in combined heat and power facilities used in producing a product or product content. Process water does not mean incidental water uses not related to the production of a product or product content, including, but not limited to, water used for restrooms, landscaping, air conditioning, heating, kitchens, and laundry.

(m) "Recycled water" means recycled water, as defined in subdivision (n) of Section 13050, that is used to offset potable demand, including recycled water supplied for direct use and indirect potable reuse, that meets the following requirements, where applicable:

(1) For groundwater recharge, including recharge through spreading basins, water supplies that are all of the following:

(A) Metered.

(B) Developed through planned investment by the urban water supplier or a wastewater treatment agency.

(C) Treated to a minimum tertiary level.

(D) Delivered within the service area of an urban retail water supplier or its urban wholesale water supplier that helps an urban retail water supplier meet its urban water use target.

(2) For reservoir augmentation, water supplies that meet the criteria of paragraph (1) and are conveyed through a distribution system constructed specifically for recycled water.

(n) "Regional water resources management" means sources of supply resulting from watershed-based planning for sustainable local water reliability or any of the following alternative sources of water:

(1) The capture and reuse of stormwater or rainwater.

(2) The use of recycled water.

(3) The desalination of brackish groundwater.

(4) The conjunctive use of surface water and groundwater in a manner that is consistent with the safe yield of the groundwater basin.

(o) "Reporting period" means the years for which an urban retail water supplier reports compliance with the urban water use targets.

(p) "Urban retail water supplier" means a water supplier, either publicly or privately owned, that directly provides potable municipal water to more than 3,000 end users or that supplies more than 3,000 acre-feet of potable water annually at retail for municipal purposes.

(q) "Urban water use target" means the urban retail water supplier's targeted future daily per capita water use.

(r) "Urban wholesale water supplier," means a water supplier, either publicly or privately owned, that provides more than 3,000 acre-feet of water annually at wholesale for potable municipal purposes.

Chapter 3. Urban Retail Water Suppliers

10608.16. (a) The state shall achieve a 20-percent reduction in urban per capita water use in California on or before December 31, 2020.

(b) The state shall make incremental progress towards the state target specified in subdivision (a) by reducing urban per capita water use by at least 10 percent on or before December 31, 2015.

10608.20. (a) (1) Each urban retail water supplier shall develop urban water use targets and an interim urban water use target by July 1, 2011. Urban retail water suppliers may elect to determine and report progress toward achieving these targets on an individual or regional basis, as provided in subdivision (a) of Section 10608.28, and may determine the targets on a fiscal year or calendar year basis.

(2) It is the intent of the Legislature that the urban water use targets described in subdivision (a) cumulatively result in a 20-percent reduction from the baseline daily per capita water use by December 31, 2020.

(b) An urban retail water supplier shall adopt one of the following methods for determining its urban water use target pursuant to subdivision (a):

(1) Eighty percent of the urban retail water supplier's baseline per capita daily water use.

(2) The per capita daily water use that is estimated using the sum of the following performance standards:

(A) For indoor residential water use, 55 gallons per capita daily water use as a provisional standard. Upon completion of the department's 2016 report to the Legislature pursuant to Section 10608.42, this standard may be adjusted by the Legislature by statute.

(B) For landscape irrigated through dedicated or residential meters or connections, water efficiency equivalent to the standards of the Model Water Efficient Landscape Ordinance set forth in Chapter 2.7 (commencing with Section 490) of Division 2 of Title 23 of the California Code of Regulations, as in effect the later of the year of the landscape's installation or 1992. An urban retail water supplier using the approach specified in this subparagraph shall use satellite imagery, site visits, or other best available technology to develop an accurate estimate of landscaped areas.

(C) For commercial, industrial, and institutional uses, a 10-percent reduction in water use from the baseline commercial, industrial, and institutional water use by 2020.

(3) Ninety-five percent of the applicable state hydrologic region target, as set forth in the state's draft 20x2020 Water Conservation Plan (dated April 30, 2009). If the service area of an urban water supplier includes more than one hydrologic region, the supplier shall apportion its service area to each region based on population or area.

(4) A method that shall be identified and developed by the department, through a public process, and reported to the Legislature no later than December 31, 2010. The method developed by the department shall identify per capita targets that cumulatively result in a statewide 20-percent reduction in urban daily per capita water use by December 31, 2020. In developing urban daily per capita water use targets, the department shall do all of the following:

(A) Consider climatic differences within the state.

(B) Consider population density differences within the state.

(C) Provide flexibility to communities and regions in meeting the targets.

(D) Consider different levels of per capita water use according to plant water needs in different regions.

(E) Consider different levels of commercial, industrial, and institutional water use in different regions of the state.

(F) Avoid placing an undue hardship on communities that have implemented conservation measures or taken actions to keep per capita water use low.

(c) If the department adopts a regulation pursuant to paragraph (4) of subdivision (b) that results in a requirement that an urban retail water supplier achieve a reduction in daily per capita water use that is greater than 20 percent by December 31, 2020, an urban retail water supplier that adopted the method described in paragraph (4) of subdivision (b) may limit its urban water use target to a reduction of not more than 20 percent by December 31, 2020, by adopting the method described in paragraph (1) of subdivision (b).

(d) The department shall update the method described in paragraph (4) of subdivision (b) and report to the Legislature by December 31, 2014. An urban retail water supplier that adopted the method described in paragraph (4) of subdivision (b) may adopt a new urban daily per capita water use target pursuant to this updated method.

(e) An urban retail water supplier shall include in its urban water management plan required pursuant to Part 2.6 (commencing with Section 10610) due in 2010 the baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data.

(f) When calculating per capita values for the purposes of this chapter, an urban retail water supplier shall determine population using federal, state, and local population reports and projections.

(g) An urban retail water supplier may update its 2020 urban water use target in its 2015 urban water management plan required pursuant to Part 2.6 (commencing with Section 10610).

(h) (1) The department, through a public process and in consultation with the California Urban Water Conservation Council, shall develop technical methodologies and criteria for the consistent implementation of this part, including, but not limited to, both of the following:

(A) Methodologies for calculating base daily per capita water use, baseline commercial, industrial, and institutional water use, compliance daily per capita water use, gross water use, service area population, indoor residential water use, and landscaped area water use.

(B) Criteria for adjustments pursuant to subdivisions (d) and (e) of Section 10608.24.

(2) The department shall post the methodologies and criteria developed pursuant to this subdivision on its Internet Web site, and make written copies

available, by October 1, 2010. An urban retail water supplier shall use the methods developed by the department in compliance with this part.

(i) (1) The department shall adopt regulations for implementation of the provisions relating to process water in accordance with subdivision (*l*) of Section 10608.12, subdivision (e) of Section 10608.24, and subdivision (d) of Section 10608.26.

(2) The initial adoption of a regulation authorized by this subdivision is deemed to address an emergency, for purposes of Sections 11346.1 and 11349.6 of the Government Code, and the department is hereby exempted for that purpose from the requirements of subdivision (b) of Section 11346.1 of the Government Code. After the initial adoption of an emergency regulation pursuant to this subdivision, the department shall not request approval from the Office of Administrative Law to readopt the regulation as an emergency regulation pursuant to Section 11346.1 of the Government Code.

(j) An urban retail water supplier shall be granted an extension to July 1, 2011, for adoption of an urban water management plan pursuant to Part 2.6 (commencing with Section 10610) due in 2010 to allow use of technical methodologies developed by the department pursuant to paragraph (4) of subdivision (b) and subdivision (h). An urban retail water supplier that adopts an urban water management plan due in 2010 that does not use the methodologies developed by the department pursuant to subdivision (h) shall amend the plan by July 1, 2011, to comply with this part.

10608.22. Notwithstanding the method adopted by an urban retail water supplier pursuant to Section 10608.20, an urban retail water supplier's per capita daily water use reduction shall be no less than 5 percent of base daily per capita water use as defined in paragraph (3) of subdivision (b) of Section 10608.12. This section does not apply to an urban retail water supplier with a base daily per capita water use at or below 100 gallons per capita per day.

10608.24. (a) Each urban retail water supplier shall meet its interim urban water use target by December 31, 2015.

(b) Each urban retail water supplier shall meet its urban water use target by December 31, 2020.

(c) An urban retail water supplier's compliance daily per capita water use shall be the measure of progress toward achievement of its urban water use target.

(d) (1) When determining compliance daily per capita water use, an urban retail water supplier may consider the following factors:

(A) Differences in evapotranspiration and rainfall in the baseline period compared to the compliance reporting period.

(B) Substantial changes to commercial or industrial water use resulting from increased business output and economic development that have occurred during the reporting period.

(C) Substantial changes to institutional water use resulting from fire suppression services or other extraordinary events, or from new or expanded operations, that have occurred during the reporting period.

(2) If the urban retail water supplier elects to adjust its estimate of compliance daily per capita water use due to one or more of the factors described in paragraph (1), it shall provide the basis for, and data supporting, the adjustment in the report required by Section 10608.40.

(e) When developing the urban water use target pursuant to Section 10608.20, an urban retail water supplier that has a substantial percentage of industrial water use in its service area, may exclude process water from the calculation of gross water use to avoid a disproportionate burden on another customer sector.

(f) (1) An urban retail water supplier that includes agricultural water use in an urban water management plan pursuant to Part 2.6 (commencing with Section 10610) may include the agricultural water use in determining gross water use. An urban retail water supplier that includes agricultural water use in determining gross water use and develops its urban water use target pursuant to paragraph (2) of subdivision (b) of Section 10608.20 shall use a water efficient standard for agricultural irrigation of 100 percent of reference evapotranspiration multiplied by the crop coefficient for irrigated acres.

(2) An urban retail water supplier, that is also an agricultural water supplier, is not subject to the requirements of Chapter 4 (commencing with Section 10608.48), if the agricultural water use is incorporated into its urban water use target pursuant to paragraph (1).

10608.26. (a) In complying with this part, an urban retail water supplier shall conduct at least one public hearing to accomplish all of the following:

(1) Allow community input regarding the urban retail water supplier's implementation plan for complying with this part.

(2) Consider the economic impacts of the urban retail water supplier's implementation plan for complying with this part.

(3) Adopt a method, pursuant to subdivision (b) of Section 10608.20, for determining its urban water use target.

(b) In complying with this part, an urban retail water supplier may meet its urban water use target through efficiency improvements in any combination among its customer sectors. An urban retail water supplier shall avoid placing a disproportionate burden on any customer sector.

(c) For an urban retail water supplier that supplies water to a United States Department of Defense military installation, the urban retail water supplier's implementation plan for complying with this part shall consider the United States Department of Defense military installation's requirements under federal Executive Order 13423.

(d) (1) Any ordinance or resolution adopted by an urban retail water supplier after the effective date of this section shall not require existing customers as of the effective date of this section, to undertake changes in product formulation, operations, or equipment that would reduce process water use, but may provide technical assistance and financial incentives to those customers to implement efficiency measures for process water. This section shall not limit an ordinance or resolution adopted pursuant to a declaration of drought emergency by an urban retail water supplier.

(2) This part shall not be construed or enforced so as to interfere with the requirements of Chapter 4 (commencing with Section 113980) to Chapter 13 (commencing with Section 114380), inclusive, of Part 7 of Division 104 of the Health and Safety Code, or any requirement or standard for the protection of public health, public safety, or worker safety established by federal, state, or local government or recommended by recognized standard setting organizations or trade associations.

10608.28. (a) An urban retail water supplier may meet its urban water use target within its retail service area, or through mutual agreement, by any of the following:

(1) Through an urban wholesale water supplier.

(2) Through a regional agency authorized to plan and implement water conservation, including, but not limited to, an agency established under the Bay Area Water Supply and Conservation Agency Act (Division 31 (commencing with Section 81300)).

(3) Through a regional water management group as defined in Section 10537.

(4) By an integrated regional water management funding area.

(5) By hydrologic region.

(6) Through other appropriate geographic scales for which computation methods have been developed by the department.

(b) A regional water management group, with the written consent of its member agencies, may undertake any or all planning, reporting, and implementation functions under this chapter for the member agencies that consent to those activities. Any data or reports shall provide information both for the regional water management group and separately for each consenting urban retail water supplier and urban wholesale water supplier.

10608.32. All costs incurred pursuant to this part by a water utility regulated by the Public Utilities Commission may be recoverable in rates subject to review and approval by the Public Utilities Commission, and may be recorded in a memorandum account and reviewed for reasonableness by the Public Utilities Commission.

10608.36. Urban wholesale water suppliers shall include in the urban water management plans required pursuant to Part 2.6 (commencing with Section 10610) an assessment of their present and proposed future measures, programs, and policies to help achieve the water use reductions required by this part.

10608.40. Urban water retail suppliers shall report to the department on their progress in meeting their urban water use targets as part of their urban water management plans submitted pursuant to Section 10631. The data shall be reported using a standardized form developed pursuant to Section 10608.52.

10608.42. The department shall review the 2015 urban water management plans and report to the Legislature by December 31, 2016, on progress towards achieving a 20-percent reduction in urban water use by December 31, 2020. The report shall include recommendations on changes to water efficiency standards or urban water use targets in order to achieve the 20-percent reduction and to reflect updated efficiency information and technology changes.

10608.43. The department, in conjunction with the California Urban Water Conservation Council, by April 1, 2010, shall convene a representative task force consisting of academic experts, urban retail water suppliers, environmental organizations, commercial water users, industrial water users, and institutional water users to develop alternative best management practices for commercial, industrial, and institutional users and an assessment of the potential statewide water use efficiency improvement in the commercial, industrial, and institutional sectors that would result from implementation of these best management practices. The taskforce, in conjunction with the department, shall submit a report to the Legislature by April 1, 2012, that shall include a review of multiple sectors within commercial, industrial, and institutional users and that shall recommend water use efficiency standards for commercial, industrial, and institutional users among various sectors of water use. The report shall include, but not be limited to, the following:

(a) Appropriate metrics for evaluating commercial, industrial, and institutional water use.

(b) Evaluation of water demands for manufacturing processes, goods, and cooling.

(c) Evaluation of public infrastructure necessary for delivery of recycled water to the commercial, industrial, and institutional sectors.

(d) Evaluation of institutional and economic barriers to increased recycled water use within the commercial, industrial, and institutional sectors.

(e) Identification of technical feasibility and cost of the best management practices to achieve more efficient water use statewide in the commercial, industrial, and institutional sectors that is consistent with the public interest and reflects past investments in water use efficiency.

10608.44. Each state agency shall reduce water use on facilities it operates to support urban retail water suppliers in meeting the target identified in Section 10608.16.

Chapter 4. Agricultural Water Suppliers

10608.48. (a) On or before July 31, 2012, an agricultural water supplier shall implement efficient water management practices pursuant to subdivisions (b) and (c).

(b) Agricultural water suppliers shall implement all of the following critical efficient management practices:

(1) Measure the volume of water delivered to customers with sufficient accuracy to comply with subdivision (a) of Section 531.10 and to implement paragraph (2).

(2) Adopt a pricing structure for water customers based at least in part on quantity delivered.

(c) Agricultural water suppliers shall implement additional efficient management practices, including, but not limited to, practices to accomplish all of the following, if the measures are locally cost effective and technically feasible:

(1) Facilitate alternative land use for lands with exceptionally high water duties or whose irrigation contributes to significant problems, including drainage.

(2) Facilitate use of available recycled water that otherwise would not be used beneficially, meets all health and safety criteria, and does not harm crops or soils.

(3) Facilitate the financing of capital improvements for on-farm irrigation systems.

(4) Implement an incentive pricing structure that promotes one or more of the following goals:

(A) More efficient water use at the farm level.

(B) Conjunctive use of groundwater.

(C) Appropriate increase of groundwater recharge.

(D) Reduction in problem drainage.

(E) Improved management of environmental resources.

(F) Effective management of all water sources throughout the year by adjusting seasonal pricing structures based on current conditions.

(5) Expand line or pipe distribution systems, and construct regulatory reservoirs to increase distribution system flexibility and capacity, decrease maintenance, and reduce seepage.

(6) Increase flexibility in water ordering by, and delivery to, water customers within operational limits.

(7) Construct and operate supplier spill and tailwater recovery systems.

(8) Increase planned conjunctive use of surface water and groundwater within the supplier service area.

(9) Automate canal control structures.

(10) Facilitate or promote customer pump testing and evaluation.

(11) Designate a water conservation coordinator who will develop and implement the water management plan and prepare progress reports.

(12) Provide for the availability of water management services to water users. These services may include, but are not limited to, all of the following:

(A) On-farm irrigation and drainage system evaluations.

(B) Normal year and real-time irrigation scheduling and crop evapotranspiration information.

(C) Surface water, groundwater, and drainage water quantity and quality data.

(D) Agricultural water management educational programs and materials for farmers, staff, and the public.

(13) Evaluate the policies of agencies that provide the supplier with water to identify the potential for institutional changes to allow more flexible water deliveries and storage.

(14) Evaluate and improve the efficiencies of the supplier's pumps.

(d) Agricultural water suppliers shall include in the agricultural water management plans required pursuant to Part 2.8 (commencing with Section 10800) a report on which efficient water management practices have been implemented and are planned to be implemented, an estimate of the water use efficiency improvements that have occurred since the last report, and an estimate of the water use efficiency improvements estimated to occur five and 10 years in the future. If an agricultural water supplier determines that an efficient water management practice is not locally cost effective or technically feasible, the supplier shall submit information documenting that determination.

(e) The data shall be reported using a standardized form developed pursuant to Section 10608.52.

(f) An agricultural water supplier may meet the requirements of subdivisions (d) and (e) by submitting to the department a water conservation plan submitted to the United States Bureau of Reclamation that meets the requirements described in Section 10828.

(g) On or before December 31, 2013, December 31, 2016, and December 31, 2021, the department, in consultation with the board, shall submit to the Legislature a report on the agricultural efficient water management practices that have been implemented and are planned to be implemented and an assessment of the manner in which the implementation of those efficient water management practices has affected and will affect agricultural operations, including estimated water use efficiency improvements, if any.

(h) The department may update the efficient water management practices required pursuant to subdivision (c), in consultation with the Agricultural Water Management Council, the United States Bureau of Reclamation, and the board. All efficient water management practices for agricultural water use pursuant to this chapter shall be adopted or revised by the department only after the department conducts public hearings to allow participation of the diverse geographical areas and interests of the state.

(i) (1) The department shall adopt regulations that provide for a range of options that agricultural water suppliers may use or implement to comply with the measurement requirement in paragraph (1) of subdivision (b).

(2) The initial adoption of a regulation authorized by this subdivision is deemed to address an emergency, for purposes of Sections 11346.1 and 11349.6 of the Government Code, and the department is hereby exempted for that purpose from the requirements of subdivision (b) of Section 11346.1 of the Government Code. After the initial adoption of an emergency regulation pursuant to this subdivision, the department shall not request approval from the Office of Administrative Law to readopt the regulation as an emergency regulation pursuant to Section 11346.1 of the Government Code.

Chapter 5. Sustainable Water Management

10608.50. (a) The department, in consultation with the board, shall promote implementation of regional water resources management practices through increased incentives and removal of barriers consistent with state and federal law. Potential changes may include, but are not limited to, all of the following:

(1) Revisions to the requirements for urban and agricultural water management plans.

(2) Revisions to the requirements for integrated regional water management plans.

(3) Revisions to the eligibility for state water management grants and loans.

(4) Revisions to state or local permitting requirements that increase water supply opportunities, but do not weaken water quality protection under state and federal law.

(5) Increased funding for research, feasibility studies, and project construction.

(6) Expanding technical and educational support for local land use and water management agencies.

(b) No later than January 1, 2011, and updated as part of the California Water Plan, the department, in consultation with the board, and with public input, shall propose new statewide targets, or review and update existing statewide targets, for regional water resources management practices, including, but not limited to, recycled water, brackish groundwater desalination, and infiltration and direct use of urban stormwater runoff.

Chapter 6. Standardized Data Collection

10608.52. (a) The department, in consultation with the board, the California Bay-Delta Authority or its successor agency, the State Department of Public Health, and the Public Utilities Commission, shall develop a single standardized water use reporting form to meet the water use information needs of each agency, including the needs of urban water suppliers that elect to determine and report progress toward achieving targets on a regional basis as provided in subdivision (a) of Section 10608.28.

(b) At a minimum, the form shall be developed to accommodate information sufficient to assess an urban water supplier's compliance with conservation targets pursuant to Section 10608.24 and an agricultural water supplier's compliance with implementation of efficient water management practices pursuant to subdivision (a) of Section 10608.48. The form shall accommodate reporting by urban water suppliers on an individual or regional basis as provided in subdivision (a) of Section 10608.28.

Chapter 7. Funding Provisions

10608.56. (a) On and after July 1, 2016, an urban retail water supplier is not eligible for a water grant or loan awarded or administered by the state unless the supplier complies with this part.

(b) On and after July 1, 2013, an agricultural water supplier is not eligible for a water grant or loan awarded or administered by the state unless the supplier complies with this part.

(c) Notwithstanding subdivision (a), the department shall determine that an urban retail water supplier is eligible for a water grant or loan even though the supplier has not met the per capita reductions required pursuant to Section 10608.24, if the urban retail water supplier has submitted to the department for approval a schedule, financing plan, and budget, to be included in the grant or loan agreement, for achieving the per capita reductions. The supplier may request grant or loan funds to achieve the per capita reductions to the extent the request is consistent with the eligibility requirements applicable to the water funds.

(d) Notwithstanding subdivision (b), the department shall determine that an agricultural water supplier is eligible for a water grant or loan even though the supplier is not implementing all of the efficient water management practices described in Section 10608.48, if the agricultural water supplier has submitted to the department for approval a schedule, financing plan, and budget, to be included in the grant or loan agreement, for implementation of the efficient water management practices. The supplier may request grant or loan funds to implement the efficient water management practices to the extent the request is consistent with the eligibility requirements applicable to the water funds.

(e) Notwithstanding subdivision (a), the department shall determine that an urban retail water supplier is eligible for a water grant or loan even though the supplier has not met the per capita reductions required pursuant to Section 10608.24, if the urban retail water supplier has submitted to the department for approval documentation demonstrating that its entire service area qualifies as a disadvantaged community.

(f) The department shall not deny eligibility to an urban retail water supplier or agricultural water supplier in compliance with the requirements of this part and Part 2.8 (commencing with Section 10800), that is participating in a multiagency water project, or an integrated regional water management plan, developed pursuant to Section 75026 of the Public Resources Code, solely on the basis that one or more of the agencies participating in the project or plan is not implementing all of the requirements of this part or Part 2.8 (commencing with Section 10800).

10608.60. (a) It is the intent of the Legislature that funds made available by Section 75026 of the Public Resources Code should be expended, consistent with Division 43 (commencing with Section 75001) of the Public Resources Code and upon appropriation by the Legislature, for grants to implement this part. In the allocation of funding, it is the intent of the

Legislature that the department give consideration to disadvantaged communities to assist in implementing the requirements of this part.

(b) It is the intent of the Legislature that funds made available by Section 75041 of the Public Resources Code, should be expended, consistent with Division 43 (commencing with Section 75001) of the Public Resources Code and upon appropriation by the Legislature, for direct expenditures to implement this part.

Chapter 8. Quantifying Agricultural Water Use Efficiency

10608.64. The department, in consultation with the Agricultural Water Management Council, academic experts, and other stakeholders, shall develop a methodology for quantifying the efficiency of agricultural water use. Alternatives to be assessed shall include, but not be limited to, determination of efficiency levels based on crop type or irrigation system distribution uniformity. On or before December 31, 2011, the department shall report to the Legislature on a proposed methodology and a plan for implementation. The plan shall include the estimated implementation costs and the types of data needed to support the methodology. Nothing in this section authorizes the department to implement a methodology established pursuant to this section.

SEC. 2. Section 10631.5 of the Water Code is amended to read:

10631.5. (a) (1) Beginning January 1, 2009, the terms of, and eligibility for, a water management grant or loan made to an urban water supplier and awarded or administered by the department, state board, or California Bay-Delta Authority or its successor agency shall be conditioned on the implementation of the water demand management measures described in Section 10631, as determined by the department pursuant to subdivision (b).

(2) For the purposes of this section, water management grants and loans include funding for programs and projects for surface water or groundwater storage, recycling, desalination, water conservation, water supply reliability, and water supply augmentation. This section does not apply to water management projects funded by the federal American Recovery and Reinvestment Act of 2009 (Public Law 111-5).

(3) Notwithstanding paragraph (1), the department shall determine that an urban water supplier is eligible for a water management grant or loan even though the supplier is not implementing all of the water demand management measures described in Section 10631, if the urban water supplier has submitted to the department for approval a schedule, financing plan, and budget, to be included in the grant or loan agreement, for implementation of the water demand management measures. The supplier may request grant or loan funds to implement the water demand management measures to the extent the request is consistent with the eligibility requirements applicable to the water management funds.

(4) (A) Notwithstanding paragraph (1), the department shall determine that an urban water supplier is eligible for a water management grant or loan even though the supplier is not implementing all of the water demand management measures described in Section 10631, if an urban water supplier submits to the department for approval documentation demonstrating that a water demand management measure is not locally cost effective. If the department determines that the documentation submitted by the urban water supplier fails to demonstrate that a water demand management measure is not locally cost effective, the department shall notify the urban water supplier and the agency administering the grant or loan program within 120 days that the documentation does not satisfy the requirements for an exemption, and include in that notification a detailed statement to support the determination.

(B) For purposes of this paragraph, "not locally cost effective" means that the present value of the local benefits of implementing a water demand management measure is less than the present value of the local costs of implementing that measure.

(b) (1) The department, in consultation with the state board and the California Bay-Delta Authority or its successor agency, and after soliciting public comment regarding eligibility requirements, shall develop eligibility requirements to implement the requirement of paragraph (1) of subdivision (a). In establishing these eligibility requirements, the department shall do both of the following:

(A) Consider the conservation measures described in the Memorandum of Understanding Regarding Urban Water Conservation in California, and alternative conservation approaches that provide equal or greater water savings.

(B) Recognize the different legal, technical, fiscal, and practical roles and responsibilities of wholesale water suppliers and retail water suppliers.

(2) (A) For the purposes of this section, the department shall determine whether an urban water supplier is implementing all of the water demand management measures described in Section 10631 based on either, or a combination, of the following:

(i) Compliance on an individual basis.

(ii) Compliance on a regional basis. Regional compliance shall require participation in a regional conservation program consisting of two or more urban water suppliers that achieves the level of conservation or water efficiency savings equivalent to the amount of conservation or savings achieved if each of the participating urban water suppliers implemented the water demand management measures. The urban water supplier administering the regional program shall provide participating urban water suppliers and the department with data to demonstrate that the regional program is consistent with this clause. The department shall review the data to determine whether the urban water suppliers in the regional program are meeting the eligibility requirements.

(B) The department may require additional information for any determination pursuant to this section.

(3) The department shall not deny eligibility to an urban water supplier in compliance with the requirements of this section that is participating in a multiagency water project, or an integrated regional water management plan, developed pursuant to Section 75026 of the Public Resources Code, solely on the basis that one or more of the agencies participating in the project or plan is not implementing all of the water demand management measures described in Section 10631.

(c) In establishing guidelines pursuant to the specific funding authorization for any water management grant or loan program subject to this section, the agency administering the grant or loan program shall include in the guidelines the eligibility requirements developed by the department pursuant to subdivision (b).

(d) Upon receipt of a water management grant or loan application by an agency administering a grant and loan program subject to this section, the agency shall request an eligibility determination from the department with respect to the requirements of this section. The department shall respond to the request within 60 days of the request.

(e) The urban water supplier may submit to the department copies of its annual reports and other relevant documents to assist the department in determining whether the urban water supplier is implementing or scheduling the implementation of water demand management activities. In addition, for urban water suppliers that are signatories to the Memorandum of Understanding Regarding Urban Water Conservation in California and submit biennial reports to the California Urban Water Conservation Council in accordance with the memorandum, the department may use these reports to assist in tracking the implementation of water demand management measures.

(f) This section shall remain in effect only until July 1, 2016, and as of that date is repealed, unless a later enacted statute, that is enacted before July 1, 2016, deletes or extends that date.

SEC. 3. Part 2.8 (commencing with Section 10800) of Division 6 of the Water Code is repealed.

SEC. 4. Part 2.8 (commencing with Section 10800) is added to Division 6 of the Water Code, to read:

PART 2.8. AGRICULTURAL WATER MANAGEMENT PLANNING

Chapter 1. General Declarations and Policy

10800. This part shall be known and may be cited as the Agricultural Water Management Planning Act.

10801. The Legislature finds and declares all of the following:

(a) The waters of the state are a limited and renewable resource.

(b) The California Constitution requires that water in the state be used in a reasonable and beneficial manner.

(c) Urban water districts are required to adopt water management plans.

(d) The conservation of agricultural water supplies is of great statewide concern.
(e) There is a great amount of reuse of delivered water, both inside and outside the water service areas.
(f) Significant noncrop beneficial uses are associated with agricultural water use, including streamflows and wildlife habitat.
(g) Significant opportunities exist in some areas, through improved irrigation water management, to conserve water or to reduce the quantity of highly saline or toxic drainage water.
(h) Changes in water management practices should be carefully planned and implemented to minimize adverse effects on other beneficial uses currently being served.
(i) Agricultural water suppliers that receive water from the federal Central Valley Project are required by federal law to prepare and implement water conservation plans.
(j) Agricultural water users applying for a permit to appropriate water from the board are required to prepare and implement water conservation plans.
10802. The Legislature finds and declares that all of the following are the policies of the state:
(a) The conservation of water shall be pursued actively to protect both the people of the state and the state's water resources.
(b) The conservation of agricultural water supplies shall be an important criterion in public decisions with regard to water.
(c) Agricultural water suppliers shall be required to prepare water management plans to achieve conservation of water.

Chapter 2. Definitions

10810. Unless the context otherwise requires, the definitions set forth in this chapter govern the construction of this part.
10811. "Agricultural water management plan" or "plan" means an agricultural water management plan prepared pursuant to this part.
10812. "Agricultural water supplier" has the same meaning as defined in Section 10608.12.
10813. "Customer" means a purchaser of water from a water supplier who uses water for agricultural purposes.
10814. "Person" means any individual, firm, association, organization, partnership, business, trust, corporation, company, public agency, or any agency of that entity.
10815. "Public agency" means any city, county, city and county, special district, or other public entity.
10816. "Urban water supplier" has the same meaning as set forth in Section 10617.

10817. "Water conservation" means the efficient management of water resources for beneficial uses, preventing waste, or accomplishing additional benefits with the same amount of water.

Chapter 3. Agricultural Water Management Plans

Article 1. General Provisions

10820. (a) An agricultural water supplier shall prepare and adopt an agricultural water management plan in the manner set forth in this chapter on or before December 31, 2012, and shall update that plan on December 31, 2015, and on or before December 31 every five years thereafter.

(b) Every supplier that becomes an agricultural water supplier after December 31, 2012, shall prepare and adopt an agricultural water management plan within one year after the date it has become an agricultural water supplier.

(c) A water supplier that indirectly provides water to customers for agricultural purposes shall not prepare a plan pursuant to this part without the consent of each agricultural water supplier that directly provides that water to its customers.

10821. (a) An agricultural water supplier required to prepare a plan pursuant to this part shall notify each city or county within which the supplier provides water supplies that the agricultural water supplier will be preparing the plan or reviewing the plan and considering amendments or changes to the plan. The agricultural water supplier may consult with, and obtain comments from, each city or county that receives notice pursuant to this subdivision.

(b) The amendments to, or changes in, the plan shall be adopted and submitted in the manner set forth in Article 3 (commencing with Section 10840).

Article 2. Contents of Plans

10825. (a) It is the intent of the Legislature in enacting this part to allow levels of water management planning commensurate with the numbers of customers served and the volume of water supplied.

(b) This part does not require the implementation of water conservation programs or practices that are not locally cost effective.

10826. An agricultural water management plan shall be adopted in accordance with this chapter. The plan shall do all of the following:

(a) Describe the agricultural water supplier and the service area, including all of the following:

(1) Size of the service area.

(2) Location of the service area and its water management facilities.

(3) Terrain and soils.

(4) Climate.

(5) Operating rules and regulations.
(6) Water delivery measurements or calculations.
(7) Water rate schedules and billing.
(8) Water shortage allocation policies.
(b) Describe the quantity and quality of water resources of the agricultural water supplier, including all of the following:
(1) Surface water supply.
(2) Groundwater supply.
(3) Other water supplies.
(4) Source water quality monitoring practices.
(5) Water uses within the agricultural water supplier's service area, including all of the following:
(A) Agricultural.
(B) Environmental.
(C) Recreational.
(D) Municipal and industrial.
(E) Groundwater recharge.
(F) Transfers and exchanges.
(G) Other water uses.
(6) Drainage from the water supplier's service area.
(7) Water accounting, including all of the following:
(A) Quantifying the water supplier's water supplies.
(B) Tabulating water uses.
(C) Overall water budget.
(8) Water supply reliability.
(c) Include an analysis, based on available information, of the effect of climate change on future water supplies.
(d) Describe previous water management activities.
(e) Include in the plan the water use efficiency information required pursuant to Section 10608.48.

10827. Agricultural water suppliers that are members of the Agricultural Water Management Council, and that submit water management plans to that council in accordance with the "Memorandum of Understanding Regarding Efficient Water Management Practices By Agricultural Water Suppliers In California," dated January 1, 1999, may submit the water management plans identifying water demand management measures currently being implemented, or scheduled for implementation, to satisfy the requirements of Section 10826.

10828. (a) Agricultural water suppliers that are required to submit water conservation plans to the United States Bureau of Reclamation pursuant to either the Central Valley Project Improvement Act (Public Law 102-575) or the Reclamation Reform Act of 1982, or both, may submit those water conservation plans to satisfy the requirements of Section 10826, if both of the following apply:
(1) The agricultural water supplier has adopted and submitted the water conservation plan to the United States Bureau of Reclamation within the previous four years.

(2) The United States Bureau of Reclamation has accepted the water conservation plan as adequate.

(b) This part does not require agricultural water suppliers that are required to submit water conservation plans to the United States Bureau of Reclamation pursuant to either the Central Valley Project Improvement Act (Public Law 102-575) or the Reclamation Reform Act of 1982, or both, to prepare and adopt water conservation plans according to a schedule that is different from that required by the United States Bureau of Reclamation.

10829. An agricultural water supplier may satisfy the requirements of this part by adopting an urban water management plan pursuant to Part 2.6 (commencing with Section 10610) or by participation in areawide, regional, watershed, or basinwide water management planning if those plans meet or exceed the requirements of this part.

Article 3. Adoption and Implementation of Plans

10840. Every agricultural water supplier shall prepare its plan pursuant to Article 2 (commencing with Section 10825).

10841. Prior to adopting a plan, the agricultural water supplier shall make the proposed plan available for public inspection, and shall hold a public hearing on the plan. Prior to the hearing, notice of the time and place of hearing shall be published within the jurisdiction of the publicly owned agricultural water supplier pursuant to Section 6066 of the Government Code. A privately owned agricultural water supplier shall provide an equivalent notice within its service area and shall provide a reasonably equivalent opportunity that would otherwise be afforded through a public hearing process for interested parties to provide input on the plan. After the hearing, the plan shall be adopted as prepared or as modified during or after the hearing.

10842. An agricultural water supplier shall implement the plan adopted pursuant to this chapter in accordance with the schedule set forth in its plan, as determined by the governing body of the agricultural water supplier.

10843. (a) An agricultural water supplier shall submit to the entities identified in subdivision (b) a copy of its plan no later than 30 days after the adoption of the plan. Copies of amendments or changes to the plans shall be submitted to the entities identified in subdivision (b) within 30 days after the adoption of the amendments or changes.

(b) An agricultural water supplier shall submit a copy of its plan and amendments or changes to the plan to each of the following entities:

(1) The department.

(2) Any city, county, or city and county within which the agricultural water supplier provides water supplies.

(3) Any groundwater management entity within which jurisdiction the agricultural water supplier extracts or provides water supplies.

(4) Any urban water supplier within which jurisdiction the agricultural water supplier provides water supplies.

(5) Any city or county library within which jurisdiction the agricultural water supplier provides water supplies.

(6) The California State Library.

(7) Any local agency formation commission serving a county within which the agricultural water supplier provides water supplies.

10844. (a) Not later than 30 days after the date of adopting its plan, the agricultural water supplier shall make the plan available for public review on the agricultural water supplier's Internet Web site.

(b) An agricultural water supplier that does not have an Internet Web site shall submit to the department, not later than 30 days after the date of adopting its plan, a copy of the adopted plan in an electronic format. The department shall make the plan available for public review on the department's Internet Web site.

10845. (a) The department shall prepare and submit to the Legislature, on or before December 31, 2013, and thereafter in the years ending in six and years ending in one, a report summarizing the status of the plans adopted pursuant to this part.

(b) The report prepared by the department shall identify the outstanding elements of any plan adopted pursuant to this part. The report shall include an evaluation of the effectiveness of this part in promoting efficient agricultural water management practices and recommendations relating to proposed changes to this part, as appropriate.

(c) The department shall provide a copy of the report to each agricultural water supplier that has submitted its plan to the department. The department shall also prepare reports and provide data for any legislative hearing designed to consider the effectiveness of plans submitted pursuant to this part.

(d) This section does not authorize the department, in preparing the report, to approve, disapprove, or critique individual plans submitted pursuant to this part.

Chapter 4. Miscellaneous Provisions

10850. (a) Any action or proceeding to attack, review, set aside, void, or annul the acts or decisions of an agricultural water supplier on the grounds of noncompliance with this part shall be commenced as follows:

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

(2) Any action or proceeding alleging that a plan, or action taken pursuant to the plan, does not comply with this part shall be commenced within 120 days after submitting the plan or amendments to the plan to entities in accordance with Section 10844 or the taking of that action.

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

10851. The California Environmental Quality Act (Division 13 (commencing with Section 21000) of the Public Resources Code) does not apply to the preparation and adoption of plans pursuant to this part. This part does not exempt projects for implementation of the plan or for expanded or additional water supplies from the California Environmental Quality Act.

10852. An agricultural water supplier is not eligible for a water grant or loan awarded or administered by the state unless the supplier complies with this part.

10853. No agricultural water supplier that provides water to less than 25,000 irrigated acres, excluding recycled water, shall be required to implement the requirements of this part or Part 2.55 (commencing with Section 10608) unless sufficient funding has specifically been provided to that water supplier for these purposes.

SEC. 5. This act shall take effect only if Senate Bill 1 and Senate Bill 6 of the 2009–10 Seventh Extraordinary Session of the Legislature are enacted and become effective.

O

APPENDIX B

Documentation of Public Hearing Notice

Summary of Public Hearing and Comments

Agencies Which reviewed the Draft 2010 Urban Water Management Plan

APPENDIX B

Documentation of Public Hearing Notice

Summary of Public Hearing and Comments (to be added)

Agencies Which reviewed the Draft 2010 Urban Water Management Plan (to be added)

THE PRESS-ENTERPRISE

CLASSIFIED ADVERTISING RECEIPT

Printed by: **Tinajero, Maria** Ad #: **10634564**
at: **8:32 am**
on: **Wednesday, Apr 27, 2011**

3450 Fourteenth St.
Riverside, CA 92501-3878
1-800-880-0345
951-684-1200
951-368-9018 Fax

Payment Information

Date	Payment #	Type	Card Holder	Exp.	Approval	Amount
					Total payments:	$ 0.00

Note: Advertising may be subject to credit approval.

Gross price:	$ 170.10
Net price:	$ 170.10
Total payments:	$ 0.00
Amount Due:	**$ 170.10**

Account Information

Phone #: (951) 922-3139
Name: PUBLIC WORKS / CITY OF BANNING
Address: 99 E RAMSEY ST
BANNING CA 92220

Acct #: 180764
Client:
Placed by: Holly Stuart
Fax #: (951) 922-3141

Ad Information

Classification: Legals
Publications: Press-Enterprise

Start date: **04-28-11**
Stop date: **05-05-11**
Insertions: 2

Rate code: LE-City
Ad type: Ad Liner
Taken by: Tinajero, Maria

Size: 1x80.930
Bill size: 81.00x 5.14 agate lines

Ad Copy:

NOTICE OF PUBLIC HEARING

PURSUANT TO LAW, notice is hereby given of a Public Hearing before the City Council and the Banning Utility Authority of the City of Banning, to be heard June 28, 2011 at 5:00 p.m. at the Banning Civic Center Council Chambers, 99 E. Ramsey St., Banning, California, to consider adopting the City of Banning 2010 Urban Water Management Plan. An informational presentation regarding the Urban Water Management Plan will be provided at the same location on June 14, 2011 at 5:00 p.m.

ALL INTERESTED PARTIES are invited to attend said hearing and present oral or written testimony on the matter or to send written comments to the City Clerk, P.O. Box 998, Banning, CA 92220. The City anticipates the draft 2010 Urban Water Management Plan will be available for public review beginning May 16, 2011 at the office of the City Clerk or at the Engineering Division of the Public Works Department, located at 99 E. Ramsey Street. This document may also be viewed on-line at www.ci.banning.ca.us/draft2010uwmp.

Note: If you challenge this matter in court, you may be limited to raising only those issues you or someone else raised at the public hearing described in this notice, or in written correspondence delivered to the City of Banning at, or prior to, the public hearing.

Questions regarding this matter should be directed to City of Banning, Public Works Department at (951) 922-3130.

BY ORDER OF THE CITY CLERK of the City of Banning, California.

Date: April 26, 2011

Publish: Press Enterprise
April 28, 2011
May 5, 2011

S/ Marie A. Calderon
City Clerk 4/28, 5/5

APPENDIX C

City of Banning 2010 Urban Water Management Plan Adoption

GEOSCIENCE

APPENDIX D

Document Transmittal Verifying Submittal of 2010 Urban Water Management Plan

To Department of Water Resources

GEOSCIENCE

APPENDIX D

Document Transmittal Verifying Submittal of 2010 Urban Water Management Plan

To Department of Water Resources

[PLACEHOLDER]

APPENDIX E

Department of Water Resources

Public Water System Statistics 2000 - 2010

GEOSCIENCE

Banning, City of
Duane Burk
Water Production Mgr
P.O.Box 998
Banning CA 92220

Public Water System Number: 10006 SD

Public Water System Statistics

Calendar Year 2000

1. General Information

Please follow the guidelines on the back of this form.

Contact: DUANE BURK
Title: PUB. WKS SUPER.
Phone: (909) 922-3281
Fax: (909) 849-1550
Communities served: 1

County: RIVERSIDE
Population served 26,000

2. Active Service Connections

Customer Class	Recycled Water	Potable Water		Complete this portion if the system serves all or part of an incorporated city: Inside City Limits		Outside City Limits	
		Metered	Unmetered	Metered	Unmetered	Metered	Unmetered
Single Family Residential							
Multi-family Residential							
Commercial/Institutional							
Industrial							
Landscape Irrigation							
Other							
Agricultural Irrigation							
TOTAL							

3. Total Water Into the System - Units of production: ☐ acre-feet ☐ million gallons ☐ hundred cubic feet

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Potable	*Surface*													
	Purchased 1/													
	Total Potable													
Recycled 2/														

1/ Potable wholesale supplier(s):

2/ Recycled wholesale supplier(s):
Level of treatment:

4. Metered Water Deliveries - Units of delivery: ☐ acre-feet ☐ million gallons ☐ hundred cubic feet

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
A. Single Family Residential													
B. Multi-family Residential													
C. Commercial/Institutional													
D. Industrial													
E. Landscape Irrigation													
F. Other													
***Total Urban Retail** (A thru F)*													
Agricultural Irrigation													
Wholesale*(to other agencies)*													

CITY OF BANNING

WATER PRODUCTION CALENDAR YEAR 2000

MONTH	2000 JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	TOTAL
WELL:													
1													
2		303,000	299,000	4,104,000	4,819,000		1,316,000	2,809,000	4,179,000	2,246,000	1,011,000	2,125,000	23,211,000
3	8,375,000	3,589,000	8,440,000	13,761,000	25,482,000	11,083,000	28,388,000	19,609,000	27,725,000	13,665,000	17,525,000	15,955,000	193,597,000
3	9,977,000												9,977,000
4					44,592,000	42,524,000	41,979,000						129,095,000
5	50,105,000	17,324,000					21,889,000	64,493,000	54,111,000	11,724,000		2,356,000	222,002,000
7	2,184,000	3,109,000	37,271,000	36,288,000	46,886,000	41,638,000	29,120,000	25,362,000	8,100,000			14,090,000	244,048,000
8	66,022,000	58,078,000	21,402,000	61,408,000	28,201,000	56,461,000	56,538,000	56,636,000	52,846,000	54,634,000	49,707,000	50,694,000	612,627,0[illegible]
9							1,116,000						1,116,[illegible]
10					7,153,000	49,891,000	44,124,000	42,530,000	27,317,000	29,345,000			200,360,000
11							30,767,110	6,991,388					37,758,498
12								55,119,522	34,259,100	39,785,000			129,163,622
C-2		2,409,000	24,106,000	19,348,540	20,744,000	27,041,000	27,706,432	22,943,000	22,203,000	25,484,000	20,729,000	27,936,000	240,649,972
C-3	37,457,000	15,337,000	35,078,000	43,739,000	52,008,000	36,519,000		35,575,000	30,198,000	19,519,000	39,703,000	16,010,000	361,143,000
C-4		45,778,000	25,844,000	30,225,000	45,262,000	60,534,000	65,424,000	58,271,000	46,321,000	40,723,000	38,179,000	48,101,000	504,662,000
C-5	16,244,000	8,003,000	6,470,000	10,955,000	24,337,000	13,776,000	36,801,000	18,456,000	13,064,000	5,854,000	12,196,000	24,784,000	190,940,000
TOTAL	190,364,000	153,930,000	158,910,000	219,828,540	299,484,000	339,467,000	385,168,542	408,794,910	320,323,100	242,979,000	179,050,000	202,051,000	3,100,350,092
GRAND TOTAL	190,364,000	153,930,000	158,910,000	219,828,540	299,484,000	339,467,000	385,168,542	408,794,910	320,323,100	242,979,000	179,050,000	202,051,000	3,100,350,092
MILLION GALS	190.36	153.93	158.91	219.83	299.48	339.47	385.17	408.79	320.32	242.98	179.05	202.05	3,100.35
ACRE FT	584.21	472.39	487.68	674.63	919.08	1,041.79	1,182.04	1,254.55	983.04	745.68	549.48	620.07	9,514.63

CITY OF BANNING

WATER PRODUCTION CALENDAR YEAR 2000

MONTH	2000 JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	2000 JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	TOTAL
WELL:													
1													
2		303,000	299,000	4,104,000	4,819,000		1,316,000	2,809,000	4,179,000	2,246,000	1,011,000	2,125,000	23,211,000
3	8,375,000	3,589,000	8,440,000	13,761,000	25,482,000	11,083,000	28,388,000	19,609,000	27,725,000	13,665,000	17,525,000	15,955,000	193,597,000
3	9,977,000												9,977,000
4					44,592,000	42,524,000	41,979,000						129,095,000
5	50,105,000	17,324,000					21,889,000	64,493,000	54,111,000	11,724,000		2,356,000	222,002,000
7	2,184,000	3,109,000	37,271,000	36,288,000	46,886,000	41,638,000	29,120,000	25,362,000	8,100,000			14,090,000	244,048,000
8	66,022,000	58,078,000	21,402,000	61,408,000	28,201,000	56,461,000	56,538,000	56,636,000	52,846,000	54,634,000	49,707,000	50,694,000	612,627,000
9							1,116,000						1,116,000
10					7,153,000	49,891,000	44,124,000	42,530,000	27,317,000	29,345,000			200,360,000
11							30,767,110	6,991,388					37,758,498
12								55,119,522	34,259,100	39,785,000			129,163,622
C-2		2,409,000	24,106,000	19,348,540	20,744,000	27,041,000	27,706,432	22,943,000	22,203,000	25,484,000	20,729,000	27,936,000	240,649,972
C-3	37,457,000	15,337,000	35,078,000	43,739,000	52,008,000	36,519,000		35,575,000	30,198,000	19,519,000	39,703,000	16,010,000	361,143,000
C-4		45,778,000	25,844,000	30,225,000	45,262,000	60,534,000	65,424,000	58,271,000	46,321,000	40,723,000	38,179,000	48,101,000	504,662,000
C-5	16,244,000	8,003,000	6,470,000	10,955,000	24,337,000	13,776,000	36,801,000	18,456,000	13,064,000	5,854,000	12,196,000	24,784,000	190,940,000
TOTAL	190,364,000	153,930,000	158,910,000	219,828,540	299,484,000	339,467,000	385,168,542	408,794,910	320,323,100	242,979,000	179,050,000	202,051,000	3,100,350,092
4W	4,213,000	4,941,000	1,013,000	0	3,695,000	757,000	7,048,000	6,231,000	7,249,000	1,852,000	1,718,000	2,511,000	41,228,000
OTHER		4,538,000						254,000				2,874,000	7,666,000
TOTAL	4,213,000	9,479,000	1,013,000	0	3,695,000	757,000	7,048,000	6,485,000	7,249,000	1,852,000	1,718,000	5,385,000	48,894,000
GRAND TOTAL	186,151,000	144,451,000	157,897,000	219,828,540	295,789,000	338,710,000	378,120,542	402,309,910	313,074,100	241,127,000	177,332,000	196,666,000	3,051,456,092
M[illegible]ON GALS	186.15	144.45	157.90	219.83	295.79	338.71	378.12	402.31	313.07	241.13	177.33	196.67	3,051.46
ACRE FT	571.28	443.30	484.57	674.63	907.74	1,039.46	1,160.41	1,234.64	960.79	739.99	544.21	603.55	9,364.57

State of California

Department of Water Resources

The Resources Agency

PUBLIC WATER SYSTEM STATISTICS

Calendar Year 2001

Banning, City of
Duane Burk
PO BOX 998
BANNING CA 92220
3310006

SD

1. General Information

Please follow the guidelines on the back of this form.

Contact : ____________________

Title: ____________________

Phone: ____________________

Fax: ____________________

E-mail: ____________________

Website: ____________________

Communities served: ____________________

____

County: ____________________

Population served ____________________

2. Active Service Connections

Complete this portion if the system serves all or part of an incorporated city

Customer Class	Recycled Water	Potable Water		Inside City Limits		Outside City Limits	
		Metered	Unmetered	Metered	Unmetered	Metered	Unmetered
Single Family Residential							
Multi-family Residential							
Commercial/Institutional							
Industrial							
Landscape Irrigation							
Other							
Agricultural Irrigation							
TOTAL							

3. Total Water Into the System - Units of production:

☐ acre-feet ☐ million gallons ☐ hundred cubic feet

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Potable	*Wells*													
	Surface													
	Purchased 1/													
	Total Potable													
Recycled 2/														

1/ Potable wholesale supplier(s): ____________________

2/ Recycled wholesale supplier(s): ____________________

Level of treatment: ____________________

4. Metered Water Deliveries - Units of delivery:

☐ acre-feet ☐ million gallons ☐ hundred cubic feet

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
A. Single Family Residential													
B. Multi-family Residential													
C. Commercial/Institutional													
D. Industrial													
E. Landscape Irrigation													
F. Other													
Total Urban Retail *(A thru F)*													
Agricultural Irrigation													
Wholesale*(to other agencies)*													

DWR 38 (Rev. 03/02)

CITY OF BANNING
WATER REPORT
CALENDAR YEAR 2001

MILLION GALS	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE
RESIDENTIAL	94.2	77.9	60.6	93.4	119.3	162.3
COMMERCIAL	46.2	37.9	34.2	42.8	54.8	69.5
INDUSTRIAL	2.1	2.1	1.9	2.0	2.3	2.6
PUBLIC	0.1	0.1	0.1	0.1	0.2	0.1
IRRIGATION	13.8	6.2	7.4	15.6	41.7	53.3
WHOLESALE						-
TOTAL	156.4	124.2	104.3	154.0	218.2	288.0

MILLION GALS	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE
RESIDENTIAL	94.2	77.9	60.6	93.4	119.3	162.3
APT/MULT	1.9	1.6	1.2	1.9	2.4	3.2
SINGLE FAMILY	92.3	76.3	59.4	91.6	116.9	159.1
COMMERCIAL	46.2	37.9	34.2	42.8	54.8	69.5
INDUSTRIAL	2.1	2.1	1.9	2.0	2.3	2.6
PUBLIC	0.1	0.1	0.1	0.1	0.2	0.1
IRRIGATION	13.8	6.2	7.4	15.6	41.7	53.3
WHOLESALE						
TOTAL	156.4	124.2	104.3	154.0	218.2	288.0

CITY OF BANNING
WATER REPORT
CALENDAR YEAR 2001

MILLION GALS	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	TOTAL
RESIDENTIAL	191.1	201.6	187.4	167.1	129.7	94.2	1,579
COMMERCIAL	86.8	96.7	88.8	81.7	68.9	46.3	755
INDUSTRIAL	2.7	3.1	2.7	2.5	2.2	2.0	28
PUBLIC	0.1	0.1	0.2	0.1	0.1	0.1	1
IRRIGATION	53.0	56.1	43.9	35.7	21.6	9.6	358
WHOLESALE							
TOTAL	333.7	357.6	323.0	287.1	222.4	152.1	2,721.1

MILLION GALS	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	TOTAL
RESIDENTIAL	191.1	201.6	187.4	167.1	129.7	94.2	1,578.8
APT/MULT	3.8	4.0	3.7	3.3	2.6	1.9	31.6
SINGLE FAMILY	187.3	197.6	183.6	163.7	127.1	92.3	1,547.2
COMMERCIAL	86.8	96.7	88.8	81.7	68.9	46.3	754.7
INDUSTRIAL	2.7	3.1	2.7	2.5	2.2	2.0	28.3
PUBLIC	0.1	0.1	0.2	0.1	0.1	0.1	1.4
IRRIGATION	53.0	56.1	43.9	35.7	21.6	9.6	357.9
WHOLESALE							
TOTAL	333.7	357.6	323.0	287.1	222.4	152.1	2,721.1

Department of Water Resources

The Resources Agency

PUBLIC WATER SYSTEM STATISTICS

Calendar Year 2002

Banning, City of
Duane Burk
PO BOX 998
BANNING, CA 92220
PWS# 10006 SD

1. General Information

Please follow the guidelines on the back of this form.

Contact: DUANE BURK

Title: P.W. SUPERINTENDENT

Phone: (909) 922-3281

Fax: (909) 849-1550

E-mail: dburk@ci.banning.ca.us

Website:

Communities served: 1

County: RIVERSIDE

Population served: 24650

2. Active Service Connections

Complete this portion if the system serves all or part of an incorporated city

Customer Class	Recycled Water	Potable Water Metered	Potable Water Unmetered	Inside City Limits Metered	Inside City Limits Unmetered	Outside City Limits Metered	Outside City Limits Unmetered
Single Family Residential				8584		2	
Multi-family Residential				175			
Commercial/Institutional				721			
Industrial				12			
Landscape Irrigation				7			
Other							
Agricultural Irrigation							
TOTAL				9499		2	

3. Total Water Into the System - Units of production:

☐ acre-feet ☒ million gallons ☐ hundred cubic feet

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Potable	*Wells*	200.11	180.89	208.52	235.34	289.14	339.74	354.83	326.59	332.03	295.15	212.59	188.30	316323
	Surface													
	Purchased 1/								29.87					29.87
	Total Potable	200.11	180.89	208.52	235.34	289.14	339.74	354.83	356.46	332.03	295.15	212.59	188.30	319310
Recycled 2/														

1/ Potable wholesale supplier(s): BEAUMONT CHERRY VALLEY WATER DISTRICT

2/ Recycled wholesale supplier(s):

Level of treatment:

4. Metered Water Deliveries - Units of delivery:

☐ acre-feet ☐ million gallons ☐ hundred cubic feet

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
A. Single Family Residential	85.9	92.4	100.9	111.9	127.1	171.8	191.3	186.6	172.9	153.9	112.7	100.4	1607.8
B. Multi-family Residential	1.8	1.9	2.1	2.3	2.6	3.5	3.9	3.8	3.5	3.1	2.3	2.0	32.8
C. Commercial/Institutional	46.3	40.3	47.1	54.4	127.7	-10.2	71.2	75.2	73.9	79.8	78.9	60.4	745
D. Industrial	2.0	2.0	2.2	2.0	1.9	2.6	2.8	2.6	2.7	3.7	3.1	3.0	30.6
E. Landscape Irrigation	16.0	18.2	17.9	30.3	31.4	39.6	34.6	43.4	29.4	36.4	4.4	3.4	305.0
F. Other													
***Total Urban Retail** (A thru F)*	152.0	154.8	170.2	200.9	290.7	207.3	303.8	311.6	282.4	276.9	201.4	169.2	2721.2
Agricultural Irrigation													
Wholesale *(to other agencies)*													

PUBLIC WATER SYSTEM STATISTICS

Calendar Year 2003

Banning, City of
Duane Burk, PW Superintendent
PO BOX 998
BANNING CA 92220
PWS = 3310006 SD

1. General Information

Please follow the guidelines on the back of this form.

Contact:
Title:
Phone:
Fax:
E-mail:
Website:
Communities served:

County: Riverside County
Population served: 25,000

2. Active Service Connections

Complete this portion if the system serves all or part of an incorporated city

Customer Class	Recycled Water	Potable Water Metered	Potable Water Unmetered	Inside City Limits Metered	Inside City Limits Unmetered	Outside City Limits Metered	Outside City Limits Unmetered
Single Family Residential				9420		2	
Multi-family Residential							
Commercial/Institutional				714			
Industrial				10			
Landscape Irrigation				10			
Other (Public)				12			
Agricultural Irrigation							
TOTAL				10,166		2	

3. Total Water Into the System - Units of production: ☒ acre-feet ☐ million gallons ☐ hundred cubic feet

Total = 2840.2 (recalculated) changes in F. Other (Public) on following pages

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Wells	633.42	443.14	495.80	602.36	790.74	1031.48	1328.51	1222.73	1123.91	1074.31	659.75	627.42	10,033.56
Surface													
Purchased 1/													
Total Potable													
2/													

1/ wholesale supplier(s):

2/ Recycled wholesale supplier(s):

Level of treatment:

4. Metered Water Deliveries - Units of delivery: ☐ acre-feet ☒ million gallons ☐ hundred cubic feet

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
A. Single Family Residential	85.8	99.9	66.1	92.5	96.2	153.7	182.5	195.0	187.8	163.7	126.1	104.9	1554.2
B. Multi-family Residential	1.8	2.0	1.3	1.9	2.0	3.1	3.7	4.0	3.8	3.3	2.6	2.1	31.6
C. Commercial/Institutional	50.7	66.0	40.3	46.7	53.2	73.9	89.8	99.6	93.2	76.3	117.9	66.2	873.8
D. Industrial	2.7	2.8	2.5	3.0	2.8	3.8	4.2	4.4	4.3	4.2	3.6	3.4	41.7
E. Landscape Irrigation	2.1	2.1	0.4	16.9	24.6	49.9	53.9	55.1	49.4	41.9	23.2	17.4	337.4
F. Other	9.0	8.1	9.1	8.6	8.9	8.7	8.9	9.0	8.9	9.0	8.7	9.0	105.9
Total Urban Retail (A thru F)	152.1	180.9	120.2	169.6	187.7	293.1	343.0	367.1	347.4	298.4	282.1	203.0	2944.6
Agricultural Irrigation													
Wholesale (to other agencies)													

Total = 2840.2 (recalculated) changes in F. Other (Public) on following pages

State of California

Department of Water Resources

The Resources Agency

PUBLIC WATER SYSTEM STATISTICS

Calendar Year 2004

Banning, City of
Duane Burk PW Superintendent
PO BOX 998
BANNING, CA 92220
PWS# 3310006 SD

1. General Information

Please follow the guidelines on the back of this form.

Contact: Duane Burk
Title: P.W. Superintendent
Phone: 951 922-3281
Fax: 951 849-1550
E-mail: dburk@ci.banning.ca.us
Website:
Communities served: Banning

County: Riverside
Population served 27,192

2. Active Service Connections

Complete this portion if the system serves all or part of an incorporated city

Customer Class	Recycled Water	Potable Water Metered	Potable Water Unmetered	Inside City Limits Metered	Inside City Limits Unmetered	Outside City Limits Metered	Outside City Limits Unmetered
Single Family Residential		9716					
Multi-family Residential							
Commercial/Institutional		704					
Industrial		10					
Landscape Irrigation		8					
Other (Public)		42					
Agricultural Irrigation		0					
TOTAL		10,480					

3. Total Water Into the System - Units of production: [XX] acre-feet [ ] million gallons [ ] hundred cubic feet

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Potable	Wells	649.12	535.19	662.74	710.49	903.29	1061.63	1231.47	1185.92	1066.08	795.49	502.26	553.39	9856.97
	Surface	0	0	0	0	0	0	0	0	0	0	0	0	0
	Purchased 1/	0	0	70.09	105.08	138.76	52.45	35.16	100.98	59.39	0	0	0	561.91
	Total Potable	649.12	535.19	732.23	815.57	1042.05	1114.08	1266.63	1286.90	1125.47	795.49	502.26	553.39	10,418.88
Recycled 2/														

1/ Potable wholesale supplier(s):

2/ Recycled wholesale supplier(s):

Level of treatment:

4. Metered Water Deliveries - Units of delivery: [ ] acre-feet [XX] million gallons [ ] hundred cubic feet

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
A. Single Family Residential	190.6	93.3	90.4	130.7	155.0	174.0	189.0	216.5	192.2	155.8	109.4	94.1	1681.0
B. Multi-family Residential	1.8	1.9	1.8	2.5	3.2	3.6	3.9	4.4	3.4	3.2	2.2	1.9	34.3
C. Commercial/Institutional	48.3	16.2	44.0	42.1	67.5	83.9	90.9	116.9	60.0	71.4	61.0	43.3	745.5
D. Industrial	3.3	3.0	3.3	3.6	4.0	41	4.2	3.3	5.5	3.8	3.2	3.1	44.4
E. Landscape Irrigation	12.1	13.8	16.2	27.3	36.7	32.2	61.6	56.4	49.2	37.9	8.6	10.4	362.4
F. Other (Public)	~~0.3~~	~~163.5~~	32.7	30.0	30.0	~~29.3~~	~~31.8~~	~~37.6~~	44.6	~~35.8~~	~~29.3~~	~~29.2~~	~~493.3~~ 179.1
Total Urban Retail (A thru F)	156.4	291.7	188.4	226.2	296.4	327.1	381.4	434.6	355.4	307.6	213.7	182.0	~~3360.9~~
Agricultural Irrigation													
Wholesale (*to other agencies*)													3,045.3

F. Other - values are incorrect - calculated values from tables below

Total - **2894** (BL 08/03/10) Based on report following pages

DWR 38 (Rev. 4/05)

File Copy

State of California

Department of Water Resources

The Resources Agency

PUBLIC WATER SYSTEM STATISTICS

Calendar Year 2005

Banning, City of
Duane Burk PW Superintendent
PO BOX 998
BANNING, CA 92220
PWS# 3310006 SD

1. General Information

Please follow the guidelines on the back of this form.

Contact : George Thacker
Title: Asst.PublicUtilities Dir.
Phone: 951-922-3282
Fax: 951-849-1550
E-mail: gthacker@ci.banning.ca.us
Website: www.ci.banning.ca.us
Communities served: The City of Banning
County: Riverside
Population served 27,500

2. Active Service Connections

Customer Class	Recycled Water	Potable Water Metered	Potable Water Unmetered	Inside City Limits Metered	Inside City Limits Unmetered	Outside City Limits Metered	Outside City Limits Unmetered
Single Family Residential		9,564		9,564			
Multi-family Residential		196		196			
Commercial/Institutional		758		758			
Industrial		10		10			
Landscape Irrigation		9		9			
Other							
Agricultural Irrigation							
High Valley Wtr. Dist.		1				1	
TOTAL		10,538		10,537		1	

(Inside/Outside City Limits: Complete this portion if the system serves all or part of an incorporated city)

3. Total Water Into the System - Units of production: [X] acre-feet [ ] million gallons [ ] hundred cubic feet

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Potable	Wells	402.67	322.21	371.65	679.04	803.35	910.69	1210.83	1178.65	1017.75	840.21	723.21	581.20	9041.46
	Surface													
	Purchased 1/					37.64	91.39	58.61	34.77			33.22	121.60	377.13
	Total Potable	402.67	322.21	371.65	679.04	840.99	1002.08	1269.34	1213.42	1017.75	840.21	756.43	702.80	9418.59
Recycled 2/														

1/ Potable wholesale supplier(s): Beaumont Cherry Valley Water Dist. 2/ Recycled wholesale supplier(s):

Level of treatment:

4. Metered Water Deliveries - Units of delivery: [ ] acre-feet [X] million gallons [ ] hundred cubic feet

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
A. Single Family Residential	83.0	71.6	76.9	102.5	115.8	178.6	222.1	195.9	184.1	150.4	124.6	119.0	1624.5
B. Multi-family Residential	1.7	1.5	1.6	2.1	2.4	3.6	4.5	4.0	3.8	3.1	2.5	2.4	33.2
C. Commercial/Institutional	40.8	39.3	31.8	43.7	52.7	81.0	104.4	94.2	83.9	77.0	64.7	68.7	782.2
D. Industrial	3.1	2.6	2.7	2.9	2.9	3.7	4.4	4.4	3.9	3.3	3.0	3.3	40.2
E. Landscape Irrigation	1.9	3.3	4.7	27.4	27.5	50.3	64.4	45.7	46.6	29.1	22.3	19.5	342.7
F. Other	0.2	0.2	0.3	0.3	0.3	0.4	0.4	0.5	0.5	0.4	0.4	0.3	4.2
Total Urban Retail (A thru F)	130.7	118.5	118.9	178.9	201.6	317.6	400.2	344.7	322.8	263.3	217.5	213.2	2827.0
Agricultural Irrigation													
Wholesale(to other agencies)	2.20	1.51	1.25	1.48	1.83	3.27	4.48	5.44	4.74	2.41	1.81	2.03	32.45

DWR 38 (Rev. 4/05)

State of California

Department of Water Resources

The Resources Agency

PUBLIC WATER SYSTEM STATISTICS

Calendar Year 2006

Banning, City of George Thacker,
Asst. Public Utility Dir. PO Box 998
Banning, CA 92220 PWS# 3310006
SD

1. General Information

Please follow the provided instructions.

Contact : George Thacker
Title: Assistant Public Utilities Director
Phone: (951) 922-3282
Fax: (951) 849-4573
E-mail: gthacker@ci.banning.ca.us
Website: www.ci.banning.ca.us
County: **Riverside**
Population served: **27,232**
Names of communities served: City of Banning and High Valley Water District. **Note:** Water supplied by joint wells owned by both **BCVWD*** & City of Banning under contract.

2. Active Service Connections

Customer Class	Potable Water		Recycled Water	
	Metered	Unmetered	Metered	Unmetered
Single Family Residential	9,584			
Multi-family Residential	196			
Commercial/Institutional	669			
Industrial	5			
Landscape Irrigation	9			
Other	18			
Agricultural Irrigation				
TOTAL	10481			

3. Total Water Into the System - Units of production:

☑ acre-feet ☐ million gallons ☐ hundred cubic feet

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Potable	*Wells*	559.4	582.1	446.1	508.2	839.8	1081.9	1181.7	1119.6	1041	862.8	714.4	634.6	9571.6
	Surface													
	Purchased 1/	6.4	28.4	0.8		74.1	115.3	113.7	108.5	107.1	66	46.8		667.1
	Total Potable	565.8	610.5	446.9	508.2	913.9	1197.2	1295.4	1228.1	1148.1	928.8	761.2	634.6	10238.7
Untreated Water														
Recycled 2/														

1/ Potable wholesale supplier(s): **BCVWD** *

2/ Recycled wholesale supplier(s): ________

Level of treatment: ________

4. Metered Water Deliveries - Units of delivery:

☑ acre-feet ☐ million gallons ☐ hundred cubic feet

If recycled is included, ✓box ↓	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
A.SingleFamilyResidential ☐	289.4	345.1	244.1	230.7	362.6	578	629.6	611	671.1	474.7	426.7	347.7	5210.7
B.Multi-family Residential ☐	17.6	19	17.8	17	21	24	24	25.4	27.4	22.4	20.6	18.8	255
C.Commercial/Institutional ☐	167	169.4	130	111.2	160.5	241.9	278.6	280.4	307.4	244.2	231.1	170.2	2491.9
D.Industrial ☐	8.8	9.5	8.9	8.5	10.5	12	12	12.7	13.7	11.2	10.3	9.4	127.5
E.Landscape Irrigation ☐	33.2	57.3	21.8	20	89.3	179.6	171.9	111.4	194.5	81.3	63.9	50.2	1074.4
F.Other ☐	13.3	5.1	1.8	2.3	15.5	2.4	17.3	3.7	6.8	9.2	33.6	5	116
	529.3	605.4	424.4	389.7	659.4	1037.9	1133.4	1044.6	1220.9	843	786.2	601.3	9275.5
Agricultural Irrigation ☐													
Wholesale(*to other agencies*) ☐	4.5	3.8	3.5	3.6	5.4	14.5	16	16.9	16.6	15.2	16.6	8.9	125.5

State of California

Department of Water Resources

The Resources Agency

PUBLIC WATER SYSTEM STATISTICS

Calendar Year 2007

Banning, City of
George Thacker, Asst. Publcic Utility Dir.
PO BOX 998
BANNING, CA 92220
PWS# 3310006 SD

1. General Information

Please follow the provided Instructions.

Contact:

Title:

Phone:

Fax:

E-mail:

Website:

County:

Population served: 28,500

Names of communities served: City of Banning and High Valley Water District

2. Active Service Connections

Customer Class	Potable Water		Recycled Water	
	Metered	Unmetered	Metered	Unmetered
Single Family Residential	9,501			
Multi-family Residential	196			
Commercial/Institutional	671			
Industrial	2			
Landscape Irrigation	10			
Other	23			
Agricultural Irrigation				
TOTAL	10,403			

3. *Total Water Into the System* - Units of production:

☐ acre-feet ☐ million gallons ☐ hundred cubic feet

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Potable	*Wells*	579.5	487.8	625.5	658.9	900.9	1,069.0	1,270.3	1,163.1	931.1	855.3	691.3	419.9	9,652.6
	Surface													
	Purchased 1/	0	0	42.1	57.4	72.5	64.2	43.3	57.7	57.4	64.1	64.9	66.5	590.1
	Total Potable	579.5	487.8	667.6	716.3	973.4	1,133.2	1,313.6	1,220.8	988.5	919.4	756.2	486.4	10,242.7
Untreated Water														
Recycled 2/														

1/ Potable wholesale supplier(s): BCVWD
Joint wells owned by the City and BCVWD under contract.

2/ Recycled wholesale supplier(s):

Level of treatment:

4. *Metered Water Deliveries* - Units of delivery:

☒ acre-feet ☐ million gallons ☐ hundred cubic feet

If recycled is included, ✓ box ↓	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
A.SingleFamilyResidential ☐	276.2	293.5	298.7	363.9	413.9	524.4	764.5	602.5	590.5	453.5	417.4	341.5	5340.5
B.Multi-family Residential ☐	18.6	18.1	21.8	18.6	19.7	22.9	36.3	21.8	22.0	22.8	21.1	19.5	263.2
C.Commercial/Institutional ☐	139.0	139.1	143.6	167.4	191.9	235.0	328.1	309.8	306.9	247.9	205.5	181.3	2595.5
D.Industrial ☐	5.0	5.1	5.5	8.3	9.2	9.4	8.0	8.1	6.3	6.3	5.0	4.6	80.8
E.Landscape Irrigation ☐	29.1	32.7	56.3	52.2	84.7	110.8	150.2	167.7	84.5	93.8	62.1	27.4	951.5
F.Other ☐	10.8	15.6	4.5	14.1	7.1	10.8	1.6	6.4	14.0	6.2	5.2	1.5	97.8
***Total Urban Retail** (A thru F)*	478.7	504.1	530.4	624.5	726.5	913.3	1,288.7	1,116.3	1,024.2	830.5	716.3	575.8	9329.3
Agricultural Irrigation ☐													
Wholesale(*to other agencies*) ☐	9.4	5.5	6.8	6.3	9.4	11.7	14.0	12.7	10.4	9.1	6.6	5.1	107.0

DWR 38 (Rev. 12/06)

State of California

Mailing Label

DEPARTMENT OF WATER RESOURCES

PUBLIC WATER SYSTEM STATISTICS

California Natural Resources Agency

Calendar Year 2008

1. General Information

Please follow the provided instructions.

Contact : George Thacker
Title: Assistant Water/Wastewater Director
Phone: 951 922 3282
Fax: 951 849 4573
E-mail: gthacker@ci.banning.ca.us
Website:
County: **Riverside**
Population served: **28,500**
Names of communities served: City of Banning and the High Valley Water District

2. Active Service Connections

Customer Class	Potable Water		Recycled Water	
	Metered	Unmetered	Metered	Unmetered
Single Family Residential	9,317			
Multi-family Residential	206			
Commercial/Institutional	652			
Industrial	2			
Landscape Irrigation	9			
Other	14			
Agricultural Irrigation	0			
TOTAL	10200			

3. Total Water Into the System - Units of production:

☑ acre-feet ☐ million gallons ☐ hundred cubic feet

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Potable	*Wells*	401.4	348.1	564.8	709.9	796.3	980.9	1,113.20	1,086.40	926.3	868.5	628.2	402.6	8826.6
	Surface													
	Purchased 1/	66.1	61.5	64.3	61.2	62.2	58.8	71.9	75.1	68.9	64.9	60.7	62.4	778
	Total Potable	467.5	409.6	629.1	771.1	858.5	1039.7	1185.1	1161.5	995.2	933.4	688.9	465	9604.6
Untreated Water														
Recycled 2/														

1/ Potable wholesale supplier(s): BCVWD-3 joint wells with City

2/ Recycled wholesale supplier(s):

Level of treatment:

4. Metered Water Deliveries - Units of delivery:

☑ acre-feet ☐ million gallons ☐ hundred cubic feet

If recycled is included, ✓box ↓	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
A.SingleFamilyResidential ☐	253.2	220.6	250.9	343.7	418.6	433.4	584.9	605	560.1	486	443.4	328.2	4928
B.Multi-family Residential ☐	17.4	16	16.4	17.4	20.8	19.2	24.2	25.2	25.8	24.4	21.6	17.6	246
C.Commercial/Institutional ☐	119.6	81.9	110.4	158.2	190.9	213.7	255.2	274.4	253	238.2	239.6	149.3	2284.4
D.Industrial ☐	4	4.6	5.9	6.4	8.5	7.3	4.9	6.2	6.8	6.5	6.8	5.2	73.1
E.Landscape Irrigation ☐	36.9	20.8	44.8	61.7	77.2	86.1	141.8	124.9	182.2	186	159.7	34.4	1156.5
F.Other ☐	4	0.9	0.8	2.1	5.3	0.9	7.2	23.6	5.5	4	4.1	4.3	62.7
Total Urban Retail *(A thru F)*	435.1	344.8	429.2	589.5	721.3	760.6	1018.2	1059.3	1033.4	945.1	875.2	539	8750.7
Agricultural Irrigation ☐													
Wholesale*(to other agencies)* ☐	4	4.7	4.5	6.2	6.9	8.9	10.4	10.8	9.5	9.4	6	5.4	86.7

DWR 38 (Rev. 1/09)

State of California

DEPARTMENT OF WATER RESOURCES

California Natural Resources Agency

PUBLIC WATER SYSTEM STATISTICS

Calendar Year **2009**

Mailing Label

1. General Information

Please follow the provided instructions.

Contact : Perry Gerdes
Title: Water/Wastewater Superintendent
Phone: (951) 849-3273
Fax: (951) 849-1550
E-mail: pgerdes@ci.banning.ca.us
Website: www.ci.banning.ca.us
County: **Riverside**
Population served: **27,500**
Names of communities served: Banning

2. Active Service Connections

Customer Class	Potable Water		Recycled Water	
	Metered	Unmetered	Metered	Unmetered
Single Family Residential	9640	0	0	0
Multi-family Residential	206	0	0	0
Commercial/Institutional	635	0	0	0
Industrial	2	0	0	0
Landscape Irrigation	37	0	0	0
Other	22	0	0	0
Agricultural Irrigation	0	0	0	0
TOTAL	10542	0	0	0

3. Total Water Into the System - Units of production: AF

(Select: **AF**=acre-feet; **MG**=million gallons; **CCF**=hundred cubic feet)

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Potable	*Wells*	496.63	376.06	585.53	680.34	929.84	823.32	1076.12	1052.1	953.42	737.19	613.19	406.36	8730.1
	Surface													
	Purchased 1/	26.18	0	0	0	0	87.28	68.29	68.45	66.44	68.76	66.19	68.85	520.44
	Total Potable	522.81	376.06	585.53	680.34	929.84	910.6	1144.41	1120.55	1019.86	805.95	679.38	475.21	9250.54
Untreated Water														
Recycled 2/														

1/ Potable wholesale supplier(s): BCVWD-3 joint wells with City

2/ Recycled wholesale supplier(s):
Level of treatment:

4. Metered Water Deliveries - Units of delivery:

(Select: **AF**=acre-feet; **MG**=million gallons; **CCF**=hundred cubic feet)

If recycled is included, X box ↓		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
A.SingleFamilyResidential		262.5	262.5	245.2	310.3	386.8	456.7	494.6	558	542.2	509.6	427.5	303.8	4759.7
B.Multi-family Residential		13.8	13.8	12.9	16.3	20.4	24	26	29.4	28.5	26.8	22.5	16	250.4
C.Commercial/Institutional		125.5	108.9	113.2	146.6	161.5	215.4	224.4	249.7	273.2	221.6	180.1	155.5	2175.6
D.Industrial		6.6	5.7	6	7.7	8.5	11.3	11.8	13.1	14.4	11.7	9.5	8.2	114.5
E.Landscape Irrigation		30	26	40.3	73.9	115.8	108	180.6	164.4	126.1	105.8	67	41.3	1079.2
F.Other		22.35	48	62.44	10	42.7	5	14.8	7	6.5	7.8	8.9	26	261.49
***Total Urban Retail** (A thru F)*		460.75	464.9	480.04	564.8	735.7	820.4	952.2	1021.6	990.9	883.3	715.5	550.8	8640.89
Agricultural Irrigation														
Wholesale*(to other agencies)*		6.64	4.6	5.64	5.89	8.5	8.2	10.86	11.07	9.42	7.57	5.64	4.83	88.86

State of California | DEPARTMENT OF WATER RESOURCES | California Natural Resources Agency

Mailing Label

PUBLIC WATER SYSTEM STATISTICS

Calendar Year **2010**

1. General Information

Please follow the provided instructions.

Contact : Perry Gerdes
Title: Water/ Wastewater Superintendent
Phone: 951-849-3273
Fax: 951-849-1550
E-mail: pgerdes@ci.banning.ca.us
Website: www.banning.ca.us
County: **Riverside**
Population served: **28,751**
Names of communities served: Banning

2. Active Service Connections

Customer Class	Potable Water		Recycled Water	
	Metered	Unmetered	Metered	Unmetered
Single Family Residential	10,077			
Multi-family Residential	206			
Commercial/Institutional	662			
Industrial	2			
Landscape Irrigation	37			
Other	22			
Agricultural Irrigation				
TOTAL	11006			

3. Total Water Into the System - Units of production: AF

(Select: **AF**=acre-feet; **MG**=million gallons; **CCF**=hundred cubic feet)

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Potable	*Wells*	387.14	284.09	466.82	531.8	800.41	945.27	1,081.59	1,113.44	1,012.11	678.83	577.33	451.38	8330.21
	Surface													
	Purchased 1/	67.68	61.68	19.05										148.41
	Total Potable	454.82	345.77	485.87	531.8	800.41	945.27	1081.59	1113.44	1012.11	678.83	577.33	451.38	8478.62
Untreated Water														
Recycled 2/														

1/ Potable wholesale supplier(s): BCVWD- 3 Joint Wells

2/ Recycled wholesale supplier(s):
Level of treatment:

4. Metered Water Deliveries - Units of delivery: AF

(Select: **AF**=acre-feet; **MG**=million gallons; **CCF**=hundred cubic feet)

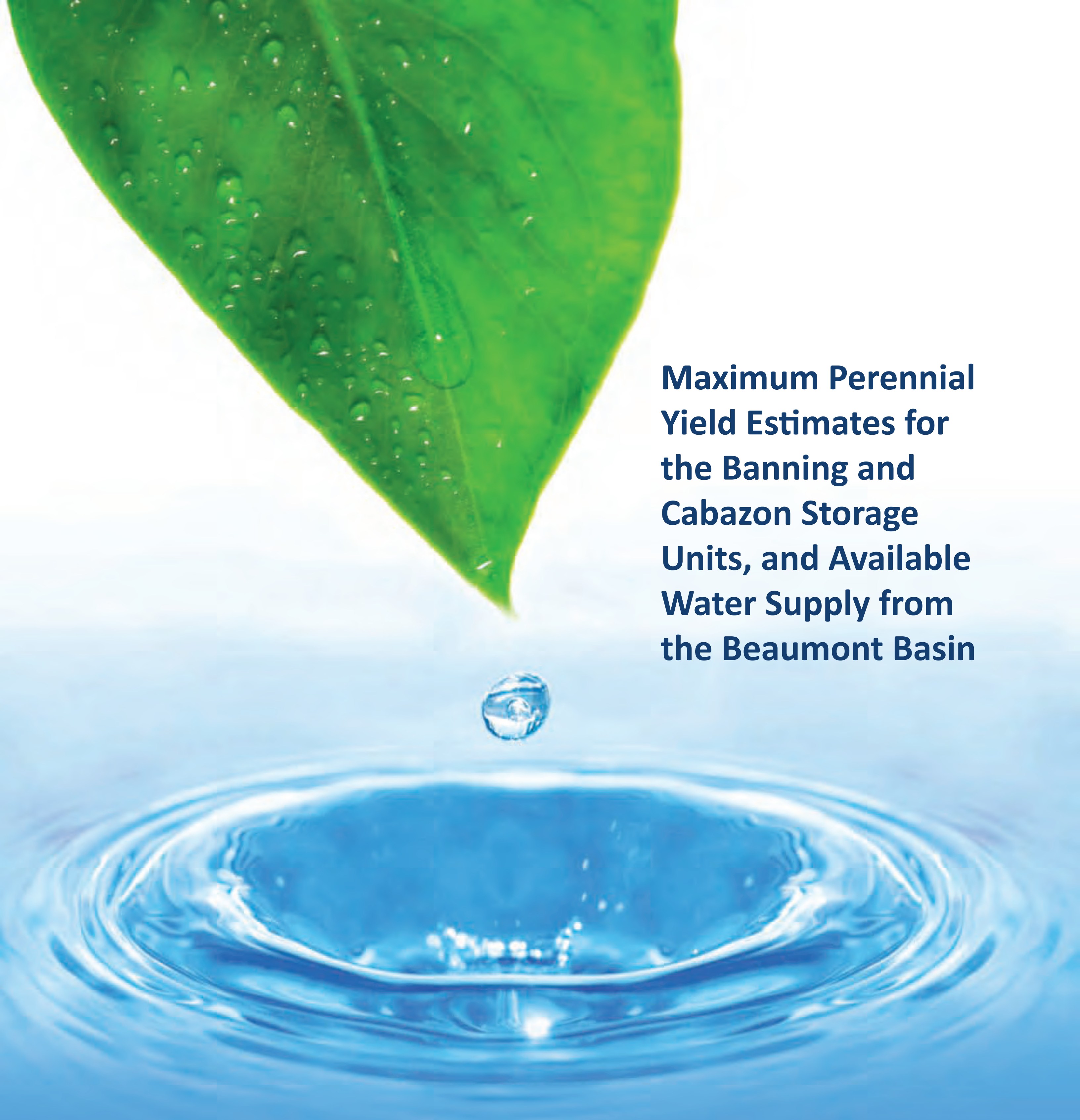
If recycled is included, X box ↓		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
A.SingleFamilyResidential		254.81	213.86	216.9	282.46	337.65	433.59	530.71	568.99	526.04	454.86	314.87	276.8	4411.54
B.Multi-family Residential		8.44	7.5	7.9	9.16	9.1	11.5	11.85	12.73	13.5	11.76	8.62	7.92	119.98
C.Commercial/Institutional		126.48	101.75	95.48	117.46	142.8	179.69	204.15	231.45	226.68	177.23	166.56	137.89	1907.62
D.Industrial		6.37	5.09	4.84	5.75	6.93	8.85	9.96	11.46	11.22	8.79	8.49	6.97	94.72
E.Landscape Irrigation		27.6	4.89	23.36	28.78	102.47	135.01	157.09	169.21	132.16	80.09	55.56	22.81	939.03
F.Other		1.95	1.13	5.83	0.45	3.18	0.71	2.01	0.98	12.71	2.73	-2.25	1.11	30.54
Total Urban Retail *(A thru F)*		425.65	334.22	354.31	444.06	602.13	769.35	915.77	994.82	922.31	735.46	551.85	453.5	7503.43
Agricultural Irrigation														
Wholesale*(to other agencies)*		4.83	3.86	4.38	4.66	6.44	9.31	10.93	11.9	9.25	7.15	4.84	4.64	82.19

APPENDIX F

Maximum Perennial Yield Estimates for the Banning and Cabazon Storage Units,

and Available Water Supply from the Beaumont Basin

GEOSCIENCE



Maximum Perennial Yield Estimates for the Banning and Cabazon Storage Units, and Available Water Supply from the Beaumont Basin

PREPARED FOR:

City of Banning

March 29, 2011

GEOSCIENCE Support Services, Inc., **Ground Water Resources Development**
P.O. Box 220, Claremont, CA 91711 | P: 909.451.6650 | F: 909.451.6638 | www.gssiwater.com

GEOSCIENCE

MAXIMUM PERENNIAL YIELD ESTIMATES FOR THE BANNING AND CABAZON STORAGE UNITS, AND AVAILABLE WATER SUPPLY FROM THE BEAUMONT BASIN

CONTENTS

FIGURES, TABLES, APPENDICES

FIGURES

FIGURES Cont.

TABLES

APPENDICES

MAXIMUM PERENNIAL YIELD ESTIMATES FOR THE BANNING AND CABAZON STORAGE UNITS, AND AVAILABLE WATER SUPPLY FROM THE BEAUMONT BASIN

1.0 EXECUTIVE SUMMARY

This report presents the data, findings and conclusions of a geohydrologic study to evaluate the maximum perennial yield for ground water storage units within the City of Banning water resource area. The City of Banning water resource area is located within the San Gorgonio Pass Area, in Riverside County, California. *The maximum perennial yield* is defined as, the long-term average quantity of ground water that can be extracted from a ground water basin on an average annual basis without causing undesirable results, including the gradual reduction of natural ground water in storage over long-term hydrologic cycles, and adverse impact to ground water quality.

Specifically, the Study Area includes an approximately 158-square mile watershed area encompassing the Banning, Banning Bench, Banning Canyon and Cabazon Storage Units. In addition, for water supply planning purposes, this report provides an estimate of long-term supply available from the Beaumont Basin--an adjudicated basin located at the western portion of the City of Banning. The scope of the study included:

1) Comprehensive analysis of previous studies, and collection of current data;
2) Evaluation of data to delineate the aquifer systems in the City of Banning area;
3) Preparation of a geohydrologic basemap;
4) Evaluation of the maximum perennial yield using multiple methods;
5) Assessment of anticipated available water supply from the Beaumont Basin; and
6) Preparation of this report.

Data reviewed to conduct the study and prepare this report included previous investigations in the area, which comprised boring logs, water level data, ground water production data, precipitation, streamflow and ground water quality data. Data were obtained from multiple sources including the City of Banning

Public Works (CBPW), the San Gorgonio Pass Water Agency (SGPWA) the United States Geological Survey (USGS), and the Beaumont Basin Watermaster.

The project area overlies the San Gorgonio Pass Subbasin. The San Gorgonio Pass Subbasin is bounded on the north by the San Bernardino Mountains and on the south by the San Jacinto Mountains. The western boundary of the ground water basin is defined by the surface drainage divide which separates the Whitewater River Drainage Basin on the east from the Santa Ana River Watershed on the west. This divide also forms the basis for the boundary between the Regional Water Quality Control Board designated South Coastal Hydrologic Area on the west from the Colorado River Hydrologic Area on the east. The eastern boundary of the ground water basin is formed by a bedrock constriction at the western boundary of the Indio Subbasin (DWR Bulletin 118).

The San Gorgonio Pass Groundwater Basin includes five hydraulically-connected ground water storage units, which constitute the City of Banning ground water resource area: the Banning Storage Unit, the Banning Bench Storage Unit, the Banning Canyon Storage Unit, the Cabazon Storage Unit, and the Beaumont Storage Unit. A map showing the location of the project area is provided as Figure 1. For purposes of this report, the Beaumont Storage Unit, which was adjudicated in 2004, will not be assessed for maximum perennial yield since the available water supply to the City of Beaumont is set by the Judgment and is to be re-evaluated every 10 years. However, a discussion of potential available water supply from City of Banning water rights in the Beaumont Basin will be provided in Section 8.0 of this report.

The current Storage Unit boundaries used in this analysis are those most recently defined in the 2006 USGS Scientific Investigations Report 2006-5026[1]. The ground water storage units are defined by ground water levels, bedrock outcrops and geologic faults, which were delineated based on significant differences in static water levels between wells or lack of pumping effects observed across storage unit boundaries (USGS 2006). The effect of the faults on ground water movement is not well defined.

[1] The storage unit boundaries were not changed in the previous GEOSCIENCE 2009 report, because the report was an update of the 2003 Safe-Yield Study for the Banning Storage Units only. The current evaluation also addresses the Cabazon Storage Unit and the Beaumont Storage Unit, and for that reason the USGS (2006) boundaries were used.

However, it is generally known that they impede normal flow causing a difference in ground water levels across the fault, but do not prevent flow from crossing the fault.

Ground water recharge to the Banning area is obtained from precipitation infiltrating into the ground within the surface water catchments and particularly in the canyons north of the city. An additional source of recharge is subsurface inflow (i.e. underflow) from storage unit to storage unit, infiltration of Whitewater River diversions in the Banning Canyon, and from percolation of wastewater into the Cabazon Storage Unit.

Analysis of maximum perennial yield for the study area was conducted using the following methods:

- Zero Net Draft Method,
- Hill Method, and
- Hydrologic Budget

For purposes of this study, previous maximum perennial yield values will not be compared to values from this analysis. The reason for this is the ground water storage unit boundaries have been modified, as defined in the 2006 USGS Scientific Investigations Report 2006-5026; therefore, the values representing previous investigations would not be applicable to the current storage unit boundaries.

The following table provides a summary of maximum perennial yield estimates using hydrologic information updated to 2010. The supporting technical data for these values is provided in the following sections of this report.

MAXIMUM PERENNIAL YIELD

[Acre-ft/year]

Storage Unit	Zero Net Draft	Hill Method	Hydrologic Budget	Average
Banning	1,580	680	N/A	**1,130**
Banning Bench	1,980	1,930	N/A	**1,960**
Banning Canyon	4,310	3,830	N/A	**4,070**
Cabazon	N/A	N/A	5,265	**5,265**
Total	**7,870**	**6,440**	**5,265**	**12,425**

Based on the average of maximum perennial yield estimates for the Banning Storage Units (Banning, Banning Bench, and Banning Canyon) and the Cabazon Storage Unit is 7,160 acre-ft/yr and 5,265 acre-ft/yr respectively, for a total of 12,425 acre-ft/yr.

2.0 INTRODUCTION

2.1 Purpose and Scope

This report presents the data, findings and conclusions of a geohydrologic study prepared for the City of Banning by GEOSCIENCE Support Services, Inc. (GEOSCIENCE). The study was conducted to determine the maximum perennial yield of the City of Banning water resource area (see Figure 1 for location) and to determine the anticipated future available water supply from the Beaumont Basin.

Specifically, the study consisted of the following principal phases of work:

1) Comprehensive analysis of previous studies, and collection of current data;
2) Evaluation of data to delineate the aquifer systems in the ground water resource area of the City of Banning;
3) Preparation of a detailed geohydrologic basemap;
4) Evaluation of the maximum perennial yield using multiple methods for the Banning Storage Units;
5) Evaluation of the maximum perennial yield using the hydrologic budget method for the Cabazon Storage Unit;
6) Assessment of anticipated available water supply from the Beaumont Basin; and
7) Preparation of this report.

While the scope of this work focused on the City of Banning area, data from the adjacent areas (such as Beaumont) were also used for areas in which the potential for hydrologic communication between storage units existed. Data reviewed included:

- Driller's logs;
- Geophysical borehole logs;
- Well completion data including total casing depths and screen intervals;
- Pumping test data;
- Well production data;
- Water level data;

- Water quality data;
- Wastewater percolation data;
- Climatic data;
- Geologic reports and maps;
- Previous geohydrologic investigations in the Banning, Beaumont and Cabazon areas; and
- Beaumont Basin Ground Water Adjudication.

2.2 Previous Investigations

Numerous investigations of the water resources of the City of Banning and San Gorgonio Pass have been conducted. One of the earliest investigations of the Beaumont Basin hydrology was conducted in 1938 (Rule, 1938). Several later investigations by the United States Department of Agriculture (USDA) assessed the impact of the Colorado River Aqueduct's San Jacinto Tunnel to the ground water of the San Jacinto Basin (USDA, 1941). In 2006 the USGS issued a *Scientific Investigations Report* which summarized the findings of a calibrated ground-water flow model. The USGS updated ground water storage boundaries previously delineated by Bloyd in 1971 (USGS, 1971) for the Banning and Cabazon Storage Units. Other relevant studies include:

- A Water Resources Investigation and Water System Master Plan for the City of Banning conducted by VTN Consulting in 1973.
- A Water Report for the City of Banning was prepared by C.M. Engineering Associates (1978). This report reviewed the entire water system and outlined improvements, as well as a long-term water plan.
- Boyle Engineering Corporation (1988) carried out a Ground Water Dependable Yield investigation for the San Gorgonio Pass Water Agency.
- GEOSCIENCE Support Services, Inc. (1990) conducted a geohydrologic investigation and well site evaluation in the City of Banning area.
- GEOSCIENCE Support Services, Inc. (1991) prepared the results of drilling, construction, testing, and pump design for four new wells for the City of Banning.
- A Safe Yield Study of the adjacent Beaumont Unit was conducted by Boyle Engineering Corporation (1995).

- San Gorgonio Pass Water Agency's 2000 – 2001 Engineer's Report on water conditions.
- GEOSCIENCE Support Services, Inc. (2003) conducted a geohydrologic investigation to determine maximum perennial yield for the Banning Storage Units.
- An Urban Water Management Plan was prepared by Wildermuth Environmental in 2005.
- San Gorgonio Pass Water Agency's 2008 Annual Report on Water Conditions.
- Riverside County Regional Detention Center Environmental Impact Report prepared by LSA, Associates, Inc. in 2009.
- GEOSCIENCE Support Services, Inc. (GEOSCIENCE, 2009) conducted a geohydrologic investigation to update the maximum perennial yield for the East and West Banning and Banning Bench Storage Units.

Since GEOSCIENCE conducted its 2009 geohydrologic investigation in the City of Banning area, additional water level and production histories have become available. Additional driller's logs have been collected, supplementing lithologic and hydrologic data for the area. Additionally, the storage unit boundaries presented in the 2006 USGS report have become accepted as the refined boundaries by the SGPWA, as evidenced by these boundaries being reflected in their most recent reports.

2.3 Sources of Data

Sources of data used in the present study included driller's logs, geophysical borehole logs, production data, water level data, weather data, pumping test data, wastewater percolation data and water quality data. These were obtained mostly from the City of Banning and other public agencies. Production data for the Cabazon Storage Unit were obtained from SGPWA Conditions of the Basin 2008 report. The Morongo Indian Tribe which pumps water from the Cabazon Storage Unit does not report annual pumping volumes. The pumping data for the Morongo Tribe used for this report was obtained from the Water Supply Assessment conducted for the Riverside County Regional Detention Center prepared by LSA Associates Inc., dated 2009. The data analysis task involved tabulating and summarizing information from documented and undocumented reports, public and private files, as well as personal communication with local and state agencies. Detailed references to sources of data and information are presented in Section 10.0.

3.0 OVERVIEW OF STUDY AREA

3.1 Study Area

The City of Banning and its surrounding water resource area encompass an area of approximately 158-square miles, in the San Gorgonio Pass and within the immediate highland areas of the San Bernardino and San Jacinto Mountains, in Riverside County, California (see Figure 1).

The study area has defined geohydrologic and hydrologic regions. Previous investigations have referred to geologic storage units (such as the Banning, Beaumont, Banning Bench and Cabazon storage units), which were delineated by Bloyd in 1971 based on geologic faults and bedrock outcrops. Since Bloyd's study in 1971, new data has been collected allowing refinement of the storage unit boundaries. The current storage unit boundaries, as defined in the USGS Scientific Investigations Report 2006-5026, are defined by bedrock outcrops and geologic faults, which were delineated based on significant differences in static water levels between wells or lack of pumping effects observed across storage unit boundaries (USGS 2006). The effect of the faults on ground water movement is not well defined; however, it is generally known that they impede but do not completely prevent flow across them.

3.2 Topography and Physiography

The City of Banning is situated at an elevation of approximately 2,500 feet above mean sea level (amsl) in the San Gorgonio Pass between the Transverse and Peninsular Ranges of Southern California (see Figure 1). The City includes portions of Banning Canyon and the Banning Bench[2], and is located north of the San Jacinto Mountains. The tallest mountain peaks in the area are Mt. San Jacinto to the southeast (10,834 feet amsl) and Mt. San Gorgonio to the north (11,502 ft amsl). Surface water flows from the slopes of the steep mountain front drainages out of the canyons to the lowlands of the San Gorgonio Pass. Surface flow is primarily from the San Bernardino Mountains to the north, but also from drainages coming from the San Jacinto Mountains to the south. Surface drainages conduct flow to the San Gorgonio River (see Figure 1).

[2] The Banning Bench comprises tectonically uplifted remnants of an older fan exiting Banning Canyon.

3.3 Climate

The Banning area is generally characterized by a typical Mediterranean climate of hot, dry summers and short, mild, moist winters.

3.3.1 Temperature

Air temperature in the City of Banning area follows a pattern of high summer and low winter temperatures. Winter temperatures are lower than those recorded in the lower basin areas of Southern California as the City of Banning is further inland and lacks the buffering effect from the Pacific Ocean. Average winter temperatures range from high daily temperatures of 60 to 69 degrees Fahrenheit to lows between 39 and 43 degrees Fahrenheit (see Table 1). The summer maximum average temperatures range from 88 to 96 degrees Fahrenheit with the lows from 53 to 59 degrees Fahrenheit (see Table 1).

3.3.2 Precipitation

Long-term annual precipitation in the Banning area is based on data collected at three representative weather stations in and around the Banning water resource area. Long-term annual precipitation was based on the Beaumont station rain gauge from 1888 through 2009 (see Figure 2 and Appendix A). Annual precipitation ranges from a minimum of 6.4 inches (1999) to a maximum of 36.37 inches (1978). The average annual precipitation is 17.77 inches per year. The average annual precipitation at the Banning Bench gauge is 22.31 inches per year (see Figure 2 and Appendix A). The average annual precipitation at the Cabazon gauge is 12.49 inches per year (see Figure 2 and Appendix A). Precipitation in the western portion of the San Gorgonio Pass is slightly higher than in the eastern portion (see Figure 2). This precipitation distribution pattern is due to the rain-shadow effect of the mountains on storms migrating inland from the Pacific Ocean.

Historical annual precipitation and cumulative departure from mean annual precipitation for the above mentioned stations are shown on Figures 3 through 5. The severity and extent of dry and wet periods can be readily observed from the plot of the cumulative summation of departures of annual precipitation from the long-term mean annual precipitation. The data indicate seven cyclical variations in the precipitation pattern from 1888 to 2009 (see Figure 3):

(1) 1893-1904: a dry period,

(2) 1905-1946: a prolonged overall wet period;

(3) 1947 to 1977: a dry period;

(4) 1978 to 1983: a wet period;

(5) 1984 to 1990: a dry period;

(6) 1991-1998: a wet period; and

(7) 1999 to present: a relatively dry period.

3.3.3 Evaporation

Evaporation rates for the Banning area are measured using an evaporation pan located at Beaumont 1E Station (see Figure 2) and are summarized in Table 1. Evaporation at this station is typically highest during the hot and dry summer months (9 to 11 inches) and lower (3 to 4 inches) in the winter months. No significant proportion of days with evaporation data occurred during freezing temperatures so these estimates were not necessary.

3.4 Existing Water Purveyors and Wells

Figure 6 shows the City of Banning production well locations[3]. The table below summarizes the known groundwater users within each ground water storage unit.

[3] Due to the close proximity of wells in some areas, only the section/subsection designations are shown on the Figure. Therefore please note the Township and Range lines shown on the Figure to determine the complete State Well Identification.

GROUND WATER USERS BY STORAGE UNIT

Storage Unit	Groundwater Users
Banning	City of Banning
Banning Bench	City of Banning Private users
Banning Canyon	City of Banning Banning Heights Mutual Water Company Private users
Cabazon	City of Banning Cabazon Water District Desert Hills Premium Outlets Mission Springs Water District Robertson's Ready Mix Morongo Indian Tribe Arrowhead Jenson's Water Company Private users

Source: SGPWA Report on Water Conditions, 2008.

The City of Banning currently operates 21 ground water production wells (personal communication with Mr. Perry Gerdes, 2010). The City also co-owns 3 production wells within the Beaumont Storage Unit. These wells are co-owned and operated by Banning and BCVWD. The City is entitled to half of the water produced from these wells. An additional five wells are available but are not equipped, and one well is abandoned (total of 29 wells). The table below summarizes the number of operable wells owned by the City reported by storage unit.

**SUMMARY OF CITY OF BANNING
ACTIVE PRODUCTION WELLS
(AS OF MAY 2010)**

Storage Unit	Number of Active Wells
Banning	4
Banning Bench	3
Banning Canyon	8
Cabazon	1
Beaumont	8

3.5 Ground Water Production

Table 2 shows annual production values for the City of Banning water resource area by storage unit for Banning, Banning Bench, Banning Canyon, and Cabazon Storage Units which includes extraction by municipal and private users.

Ground water production over the entire Banning water resource area has been increasing steadily since 1959 at an average rate of approximately 92 acre-ft/year (see Figure 7a). Currently, most production for the City of Banning takes place in the Canyon Storage Unit. See Table 2 for annual production values by storage unit.

Well production by the City of Banning within the Banning Storage Unit began in 1992, with the extraction of 406 acre-ft of water. Between 1992 and 2009, the annual extraction from the Banning Storage Unit has increased (on average) approximately 102 acre-ft/yr (see Figure 7b). The greatest amount of production occurred in 2003 with the extraction of approximately 2,381 acre-ft of water in that year. Ground water extraction is the result of production from Wells C-5, M-10, M-11, and M-12.

Annual ground water extraction from the Banning Bench Storage Unit between 1959 and 2009 has decreased at an average rate of approximately 14 acre-ft/yr (Figure 7c). The greatest amount of production occurred in 1983 with the extraction of approximately 4,036 acre-ft of water in that year. Ground water extraction is the result of production from Wells 1, 2, and 3 as well as private producers.

Annual ground water extraction from the Banning Canyon Storage Unit between 1959 and 2009 has increased at an average rate of approximately 13 acre-ft/yr (Figure 7d). The greatest amount of production occurred in 2001 with the extraction of approximately 5,604 acre-ft of water in that year. Ground water extraction is the result of production from the City of Banning Wells 4, 5, 7, 8, 9, 10, 11, and 12, Banning Heights Mutual Water Company and private producers.

Annual ground water extraction from the Cabazon Storage Unit between 1989 and 2009 has increased at an average rate of approximately 217 acre-ft/yr (Figure 7e). The greatest amount of production occurred in 2007 with the extraction of approximately 4,100 acre-ft of water in that year (see Table 2).

Ground water extraction by the City of Banning is the result of production from the City of Banning Well C6. Well C-6 began extraction from the Cabazon Storage Unit in 2004. In addition to City of Banning pumping, Cabazon Water District, Mission Springs Water District as well as private producers also pump from the Cabazon Storage Unit. A summary of ground water producers in the Cabazon Storage Units is provided on Table 3.

4.0 GEOLOGY

4.1 Regional Geology

The City of Banning is located in the San Gorgonio Pass between the Transverse and Peninsular Mountains of Southern California. Faulting and subsequent erosion has resulted in continental alluvial deposits, ranging in age from Tertiary to Quaternary, overlying consolidated basement complex. The basement complex is composed of igneous and metamorphic rocks, specifically the San Jacinto granodiorite, gneisses, schists, and quartz monzonite of pre-Tertiary age. The surrounding mountains in the area are composed of these basement rocks.

The Banning Fault is an important structure within the City of Banning water resource area. The Banning Fault forms the boundary between the Banning Canyon and the Banning Bench Storage Units (see Figure 8a). The Banning Fault zone was characterized by a right-lateral strike-slip displacement during the late Miocene (approximately 10 to 5 million years ago) (USGS, 2006). The USGS describes another fault zone, The San Gorgonio Pass Fault Zone, which includes a group of reverse, thrust, and tear faults which extend westward from the Whitewater area to the Calimesa area. According to the USGS, the fault zone exhibits the same general attitude as the Banning Fault but has no evolutionary relationship. The San Gorgonio Pass Fault Zone has a distinctive zig-zag geometry, which is illustrated by the mapped locations of the Banning, Central Banning and Eastern Banning Barrier Faults (see Figures 8a and 8c). These three concealed faults are delineated based on differences in ground water elevations and lack of observed effects during pumping of wells on the other side of the barrier (USGS, 2006). The Banning, Central and Eastern Banning Barrier Faults bound the Banning Storage unit and form the Banning and Cabazon Storage Unit boundaries reflected in this report.

4.2 Study Area Geology

4.2.1 Bedrock Complex

The bedrock in the Banning area predominantly consists of slightly gneissic granite of pre-Cretaceous age (Ransome, 1932). The consolidated rocks (pTb) in the area are comprised primarily of gneiss, schist, and quartz monzonite (see Figure 8a). Cross-section A-A’ presented on Figure 8b depicts the subsurface relationship between the geologic units described below. The explanation for the geologic symbols shown on Figure 8a and Figure 8b is provided on Figure 8c.

4.2.2 Quaternary Alluvial Deposits

The alluvial deposits in the vicinity of the City of Banning consist of many hundreds of feet of Quaternary and upper Tertiary gravels that were washed from the adjacent San Gorgonio highlands. These alluvial materials are generally poorly sorted sands and gravels, intermingled with silts and clays. Although the material near the surface is comparatively young, true recent alluvium is limited almost entirely to the areas immediately adjacent to washes and gullies. The recent alluvium contains no ground water except in areas where the water table is perched near the surface. Coarser-grained beds within the San Timoteo formation yield significant quantities of water.

Alluvial deposits in the Banning area include three general groups: Quaternary younger alluvium (Qya), Tertiary to Quaternary older alluvium (Qoa), and Tertiary to Quaternary Continental deposits (Qtcv) (see Figures 8a, 8b, and 8c).

The most recent alluvial deposits in the Banning area occur in the valley floor of the Banning Storage Units as younger alluvium (Qya). The younger alluvium consists of unconsolidated, angular boulders, sand and cobbles, and small quantities of silt, clay, and aeolian sand. Depths range from several feet to a maximum of approximately 50 feet.

Older alluvial deposits (Qoa) underlie the Qya. These deposits consist of poorly sorted, unconsolidated clay, silt, sand, and gravel ranging from approximately 10 ft to a maximum of approximately 450 ft in thickness. Qoa deposits are found in stream channels, valley floors, and flood plains over the majority of the Beaumont and Banning Bench Storage Units. Qoa deposits include the old (Qo) and very old deposits (Qvo) shown on Figure 8b. The subsurface units designated as Qsu and Qsl on Figure 8b are not exposed within the study area but are exposed to the northwest near Calimesa. Units Qsu and Qsl are the primary water-bearing units in the study area.

Tertiary to Quaternary Continental deposits (Qtcv) consist of poorly sorted cobbles, sand, silt and clay, and include the San Timoteo Beds of Frick (1921) and some volcanic rocks north of the Banning-Cabazon area.

5.0 GEOHYDROLOGY

5.1 Hydrologic Subunits

The surface water drainage catchment or hydrologic subunits encompassing the City of Banning are present in an area of approximately 158 square miles and include the surface flows from surrounding mountain runoff (see Figure 9). The significance of this hydrologic subunit area is that precipitation falling anywhere within the hydrologic subunit has the potential to contribute to the recharge of the ground water storage units which ultimately supplies water to the City of Banning.

The total drainage catchment tributary to the ground water storage units was delineated using a USGS 10 m x 10 m digital elevation model (DEM) in ESRI ArcView 9.3[4] (ESRI ArcView 9.3 is a Geographic Information System (GIS) software package). Specifically, the drainage catchment was delineated by computing flow directions from the DEM, which was then used by Arc Hydro. Arc Hydro is an ArcGIS-based system geared to support water resources applications to automatically delineate the hydrologic subunits within an area of study.

The area of the watershed catchment was used to calculate the potential water crop specifically for the Cabazon Storage Unit based on the weighted average annual precipitation for each contributing watershed (i.e. Potrero Subunit, Millard Subunit, One Horse Subunit, etc.).

5.2 Ground Water Storage Units

Ground water storage units which have been referred to in numerous investigations have been delineated in the San Gorgonio Pass area of the City of Banning by Bloyd in 1971, which were delineated based on water level differences between wells. Since Bloyd's study in 1971, more data has become available, resulting in refined storage unit boundaries by the USGS in 2006.

[4] ESRI ArcView 9.3 is a Geographic Information System (GIS) software package.

Figure 9 shows the Banning Storage Units, (Banning, Banning Bench and Banning Canyon), and the Cabazon Storage Unit as reflected in the 2006 USGS report in relationship to the hydrologic units. These boundaries, as presented in the 2006 USGS report, have been generally accepted as the refined boundaries by the USGS and SGPWA, as these boundaries are reflected in their most recent reports.

The ground water storage units are hydraulically connected generally across fault boundaries, which imply that the faults which form the storage unit boundaries leak, allowing movement of ground water from one storage unit into the adjacent storage unit. Values of leakance used by the USGS for modeling ground water flow across barriers in the study area were used in this study to estimate flow from the Banning Storage Unit into the Cabazon Storage Unit and for a portion of the underflow from the Banning Bench Storage Unit into the Cabazon Storage Unit. However, a portion of the underflow from the Banning Canyon Storage Unit into Banning Bench Storage Unit and subsequently into the Cabazon Storage Unit occurs through alluvial channel and across the fault mapped at the boundary of the Banning Bench and Cabazon Storage units.

5.3 Surface Water

Surface water in the City of Banning water resource area has an intermittent nature. Temporary runoff occurs after precipitation, ranging from small trickles to flash flooding which occurs usually in winter. Although some streamflow does occur in the steep mountain areas, it percolates rapidly into the sands and gravels in the canyons and San Gorgonio Pass area.

Surface water flow in the watersheds located both north and south of San Gorgonio Pass is tributary to the San Gorgonio River which joins the Whitewater River approximately four miles east of the Cabazon Storage Unit in the Coachella Valley. The San Gorgonio River has two USGS surface water gages (see Figure 2). The upper gage (10256200) has data for the period October 1975 to September 1977; and the lower gage (10256300) only has data for the period February 1981 to September 1981. These data sets did not contain enough data to characterize streamflow patterns for the San Gorgonio River.

Diversion of surface water from the upper reaches of the Whitewater River Drainage into Banning Canyon (Banning Canyon Storage Unit) was initiated in 1913. The diverted water flows along steep mountain slopes for approximately 14 miles in a mostly concrete lined conveyance system known as The

Flume (see Figure 9). Portions of the flume have significantly deteriorated over the years and are in need of repair. Along the flume system, Southern California Edison historically operated two powerhouses to generate hydroelectric power. Banning Heights Mutual Water Company utilizes approximately 1,000 acre-ft/year from below the second powerhouse (see Figure 2). The remainder of the diverted water flows into the San Gorgonio River below the Banning Heights Mutual Water Company abstraction point. Flows have diminished since the 1980's due to a loss of canal system capacity due to deterioration (C.M. Engineering Associates, 1978; San Gorgonio Pass Water Agency, 2002). Since 1961, on average, 1,500 acre-ft/year had been diverted into the Canyon subunit from the Whitewater River (San Gorgonio Pass Water Agency, 2002). Due to damage along sections of the flume, currently, surface flow is diverted into Burnt Canyon to the north, and then back to the Flume upstream of Powerhouse No. 1 where it continues downstream through Powerhouse No. 2 to the reservoir operated by Banning Heights Mutual Water Company. It is uncertain exactly how much of the diverted water is currently recharged into the aquifer of the Canyon subunit as the flows are not metered (personal communication with Mr. Perry Gerdes, 2010).

5.4 Ground Water

5.4.1 Aquifer Systems

The water-bearing rocks in the vicinity of Banning consist of many hundreds of feet of Quaternary and upper Tertiary gravels washed down from the adjacent San Gorgonio highlands. These alluvial materials are generally poorly sorted sand and gravels intermingled with silts and clays. Although the material near the surface is comparatively young, younger alluvium (Qya on Figure 8a) is limited almost entirely to the immediate areas around the washes and gullies. The younger alluvium contains no ground water except in areas where the water table is near the surface.

The older alluvium (Qoa on Figure 8a) occurring at the surface in the Banning areas is of Plio-Pleistocene age and unconformably overlies coarse sand and gravel layers of the San Timoteo Formation (Qtcv). Ground water is present in an upper and lower aquifer system shown as Qsu and Qsl on Figure 8b. The San Timoteo Formation dips underneath the older alluvium at low angles towards the northeast. In general, stratification in the San Timoteo Formation is better developed than the older alluvium with the result of the coarser beds within the formation yielding good quantities of water to wells. The transmissivity of the aquifers in the Banning Storage Unit is approximately 15,000 - 34,000 gpd/ft based on pumping test data from well C-5. The aquifer ranges in thickness from 40 - 1,200 ft with an average thickness of 600 ft. The hydraulic conductivity ranges from 15 - 60 gpd/ft^2 (2 - 8 ft/day; GEOSCIENCE, 1991). DWR estimates that wells in the San Gorgonio Pass Subbasin can yield 1,000 from the San Timoteo formation. Aquifer transmissivity or hydraulic conductivity data in the Canyon and Banning Bench Storage Units was not available. However, saturated thickness ranges from 30 ft to 160 ft.

5.4.2 Ground Water Occurrence and Movement

The majority of ground water in the Banning area occurs in the permeable alluvial sediments that underlies the valley floors and canyon beds. The aquifers within the younger alluvial sediments are generally unconfined to semi-confined, while ground water within the older alluvial sediments is generally confined beneath sediments of recent deposits.

Ground water flows by gravity drainage from areas of high elevation (the canyons and mountain slopes) into areas of low elevation (see Figure 10), ultimately collecting in the sediments beneath the valley floor. Hydraulic gradients in the canyon areas are relatively steep (approximately 300-500 ft/mile) but flatten out in the valley areas (approximately 90 ft/mile) (see Figure 10).

Ground water in the Banning and Banning Bench subunits generally flows southeast into the west portion of the Cabazon Storage Unit and to a lesser degree enters fractures and joints in the San Jacinto Mountains. Ground water flows east within the Cabazon Storage Unit to the Indio Subbasin.

Due to construction of the San Jacinto tunnel for the Colorado Aqueduct, ground water from the southwest portion of the Cabazon Storage Unit near the vicinity of the east portal of the San Jacinto Tunnel and from crystalline rocks in the San Jacinto Mountains flows into the tunnel through joints and fractures as well as through a series of southeast-trending geologic faults (see Figure 8a). Although the tunnel has been constructed in bedrock and is lined with concrete, an estimated 1,500 acre-ft/year of ground water seeps into the tunnel from the west portion of the Cabazon storage unit (33% of the total 5,000 acre-ft per year tunnel seepage; Boyle, 1995; personal communication, FlowScience, 2001).

5.4.3 Historical Ground Water Level Trends

Historical ground water level hydrographs for wells in the Banning Storage Units and Cabazon Storage Unit are provided in Appendix B. The locations of wells discussed in this investigation are shown on Figure 6. Figure 10 contains insets which show selected hydrographs for the storage units. Static water level elevations have been observed to fluctuate as much as 80 to 100 feet, and when plotted against the cumulative departure from mean precipitation, it is observed that there is a direct relationship of precipitation trends and ground water elevation trends. An increase in cumulative departure is mirrored by an increase in water level elevations, and a decrease in cumulative departure from mean precipitation is mirrored by a decrease in ground water elevations.

5.4.4 Recharge and Discharge

Ground water recharge in the Banning area occurs through infiltration and percolation of rainfall and surface runoff in stream channels that flow from local mountains and hills. Recharge to the Banning and Cabazon Storage Units occurs through underflow from the Beaumont Storage Unit in the western part of the study area. Additionally, underflow from the Banning Canyon Storage Unit flows into the Banning Bench, and from the Banning Bench to the Cabazon Storage Unit.

The majority of the rainfall in the lower basin elevations (valleys) is evaporated or taken up by plants before it enters the ground water system. The primary sources of replenishment to the ground water basins are infiltration of precipitation at the higher watershed elevations and surface water infiltration in the streams and drainages during major storm events or prolonged periods of high precipitation.

Recharge rates are generally highest during spring runoff when soils are saturated, temperatures are low and vegetation is inactive. Recharge is minimal during summer when most precipitation is transpired back to the atmosphere. In the fall, recharge rates increase again as photosynthesis shuts down. Frost during the winter months precludes recharge.

The primary source of ground water discharge in the storage units is pumping, and subsurface outflow into the downstream storage units; a minor amount of ground water discharge is lost by evapotranspiration. Ground water flows out of the eastern end of the Cabazon Storage Unit at a bedrock constriction at the boundary with the Indio Subbasin. The amount of ground water outflow is a function of the saturated thickness or depth to water. As discussed in the previous section, ground water levels follow the trend of rainfall. Therefore ground water level rises occurring during wet climactic cycles would result in increased outflow at the eastern end of the Cabazon Storage Unit. In addition to subsurface outflow, water is lost from the Cabazon Storage Unit through the San Jacinto Mountains (through joints and fractures).

5.4.4.1 Infiltration of Treated Wastewater, Cabazon Storage Unit

The City of Banning operates recycled water infiltration basins in the Cabazon Storage Unit. The infiltration basins receive secondary effluent water from the wastewater treatment plant which was constructed in 1968[5] and is operated by United Water Service, a public/private partnership. The average amount of effluent infiltrated between 2000 and 2009 is 2,655 acre-ft/yr. The following table is a summary of effluent discharges to the infiltration basins from 2000 to 2009.

SECONDARY EFFLUENT DISCHARGES INTO THE CABAZON STORAGE UNIT

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Acre-ft/yr	2,568	2,532	2,538	2,547	2,602	2,974	2,955	2,737	2,639	2,461

Source: City of Banning Public Works, 2010

The Wastewater infiltration basins are located approximately 1,500 feet southwest of Well R-1 (see Figure 6). Well R-1 was constructed with the intent of capture and distribution of secondary treated effluent after it has had residence time in the subsurface sediments. Discharge from the well will be placed into a recycled water system for use within the City of Banning.

[5] Page 3 of Initial Study/Mitigated Negative Declaration Wastewater Treatment Plant Expansion and Phase I Recycled Water System, May, 2008

5.4.4.2 Infiltration of Surface Water in Banning Canyon

When surface flow is present in Banning Canyon, flows are diverted by the City of Banning into off-stream recharge basins to facilitate ground water recharge (see Figure 2). According to the City of Banning, Department of Public Works (personal communication with Mr. Perry Gerdes, 2008), the off-stream infiltration basins are located in Banning Canyon approximately one mile north of the Banning Bench Storage Unit (see Figure 6). The basin surfaces were scarified (breaking up the surface of topsoil) in 2006 and surface water from San Gorgonio River has been diverted into the basins since that time. The basins are un-gauged and there has been no recordation of the volume of water that has been infiltrated into the basins. The infiltration basins are located north of the Banning Fault which forms the north boundary of the Banning Bench Storage Unit. The contribution of the infiltration basins to subsurface flow into the Banning Bench Storage unit is unknown since no gauge is currently present at the percolation basins. It is estimated that approximately 350 acre-ft/yr exit the Banning Canyon and Banning Bench Storage Units into the Cabazon Storage unit in the form of subsurface flow, or underflow.

5.4.5 Ground Water Storage

The amount of ground water in storage within the City of Banning water resource area (not including Beaumont Storage Unit) is estimated to be approximately 1.1 – 1.2 million acre-ft. This volume was estimated using ArcView GIS 10 Spatial Analyst[6] to calculate the saturated thickness within each storage unit and multiply by the estimated effective porosity (i.e. specific yield). The table below summarizes the ground water storage available to the City.

[6] ArcView GIS 10 Spatial Analyst is a Geographic Information System (GIS) software package.

GROUND WATER STORAGE AVAILABLE TO THE CITY OF BANNING

IN BANNING AND CABAZON STORAGE UNITS

Ground Water Storage Unit	Ground Water Basin Area [acres]	Average Saturated Thickness [ft]	Effective Porosity [%]	Ground Water Storage [acre-ft][7]
Banning	2,489	600	15 – 17	211,000 – 240,000
Banning Bench	3,753	30	15 – 17	1,200– 1,500
Banning Canyon	1,058	161	15 – 17	12,000 – 13,500
Cabazon[8]	17,222	350	15 – 17	880,000 – 1,000,000

The surface area of the ground water basins (excluding bedrock) was calculated using the polygonal area feature of the geographic information system (GIS) from the Storage Unit boundaries (USGS, 2006). Saturated thickness was estimated based on the depth between the current (2010) ground water levels and depth to bedrock. Depth to bedrock was estimated from lithology logs, of which only two encountered bedrock. Wells in the central parts of the basin do not intercept bedrock; as such, it is assumed that the depth to bedrock is (1) greater than the total depth of known wells in these locations, and (2) decreases towards the edges of the basin. In the Banning Storage Unit, bedrock was encountered at a depth of approximately 1,400 ft below ground surface (ft bgs). In the Cabazon Storage Unit, wells did not encounter bedrock but ranged in total depth from 500 to 1,200 ft bgs. Depth to bedrock in the Banning Canyon and Banning Bench are anticipated to be approximately 110-150 ft bgs. Water level elevations used to calculate storage are shown on Figure 10. Based on these data, the conservative saturated thickness for the Banning Storage Unit is estimated to average approximately 600 ft ranging between thicknesses of 35 – 1,170 ft. Estimates for the Banning Bench saturated thickness averages approximately 30 ft, ranging from 1 – 60 ft. The City' Banning Bench wells are

7 As a reference, the full capacity of MWD's Diamond Valley Reservoir is 800,000 acre-ft.

8 The volume of storage is approximate since the data confirming the depth to the base of the aquifer in the Cabazon Storage Unit is lacking.

located in Banning Canyon in the Banning Bench Storage Unit, saturated thickness may be greater outside the canyon area. Saturated thickness in the Banning Canyon Storage Unit averages approximately 160 ft, ranging from 2 – 360 ft. The average saturated thickness in the Cabazon Storage Unit is approximately 350 ft, ranging from 1 – 700 ft thick.

The effective porosity for the saturated sediments was determined by calculating the sand/clay ratio based on lithologic logs from seven wells in different parts of the Banning and Cabazon Storage Units. The average sand/clay ratio is approximately 60/40 which when weighted to the corresponding aquifer materials results in an average effective porosity of approximately 17 to 20 percent. A conservative value of effective porosity of 15 to 17 percent was used to estimate ground water storage volume (see above table).

5.4.6 Water Quality

Water quality is considered very good in the Banning area, with current total dissolved solids (TDS) concentrations (Spring 2009) ranging from approximately 140 to 250 milligrams per liter (mg/L). Figure 11 shows the spatial distribution of TDS in the City of Banning water resource area. The variation of TDS concentrations in wells within close proximity to one another can likely be explained by storm events flushing out the surrounding valleys which have a variation in rock type and TDS concentrations. (See Appendix C for summary of selected water quality tabulated parameters).

Most other water quality concentrations, including nitrate (as NO_3), are currently under the maximum contaminant level (MCL) or action levels. Historically, the only constituents occurring above MCLs were iron and aluminum in most wells. Lead was also detected in Wells 5, 8, 11, 12 and C3 above the US EPA Treatment Technique value which requires systems to control the corrosiveness of their water. If more than 10% percent of tap water samples exceed the action level, water systems must take additional steps. Lead has not been detected above the Treatment Technique value in any wells since 2006 (see Appendix C). Fluoride was also detected above the Secondary MCL in Well C3 in March of 1994.

Water quality samples were taken during drilling and construction of Well R-1 in 1990 (see Figure 6 for location). Well R-1 is located 1,500 feet southeast of the City's Wastewater Treatment Plant. Four aquifer zone tests were conducted within the following intervals:

Zone 1 - 600 to 620 ft bgs,
Zone 2 - 550 to 570 ft bgs,
Zone 3 - 480 to 500 ft bgs, and
Zone 4 - 410 to 430 ft bgs.

The results of the water quality testing were reviewed for this investigation to assess whether secondary effluent from the WWTP was impacting the ground water quality in the aquifer. The results of the water quality testing are provided in Appendix C. Total dissolved solids (TDS) concentration in the lower three intervals is similar to that of other City of Banning Wells [which is lower than 250 mg/L]. TDS in Zone 4 (shallowest zone at 410-430 feet bgs) had a concentration exceeding the maximum contaminant level (MCL) of 500 mg/L. Additionally Iron exceeds the MCL in all zones and Manganese exceeds the MCL in Zone 4. However, the high iron and manganese concentrations may in part be due to adsorption onto fine sediment particles[9] due to sample collection from the zones. The USGS installed a nested monitoring well system (multiple wells screened at various depths) north of the City of Banning Wastewater Treatment Plant near the Interstate 10 Freeway (see Figure 6 for location). Ground water collected from Well 3S/1E - 11F4 screened between 600 and 610 feet bgs had a TDS concentration of 338 mg/L and elevated nitrate, iron, and manganese concentrations. (See water quality results in Appendix C). Ground water samples collected from screens below this depth had decreasing TDS concentrations with depth. The TDS concentrations ranged from 296 mg/L (680 ft bgs) to 232 mg/L (1,060 ft bgs).

According to Parsons (Parsons, 2008), the TDS ranged from 336 to 461 mg/L between 2004 and 2007 with an average of 379 mg/L during that period. These values are below the values detected during shallow zone testing suggesting that either TDS concentrations from the effluent were greater prior to 1990 or there is another source for the elevated TDS in the shallow portion of the aquifer. The incomplete record of ground water levels in City of Banning Well R1 does not allow assessment of the affect on ground water levels due to infiltration of wastewater in the Cabazon Storage Unit.

[9] More recent zone testing protocol developed by GEOSCIENCE uses 0.45 micron filters during field sample collection to eliminate the potential for elevated metals due to sediment in the sample water.

6.0 METHODOLOGY FOR DETERMINATION OF MAXIMUM PERENNIAL YIELD

Maximum perennial yield is defined as the maximum amount of ground water that can be extracted on an average annual basis without causing environmental damage or adverse impacts. This maximum amount is a function of the amount of ground water recharge that the aquifers receive from precipitation, underflow, artificial recharge, local irrigation and return flows on an average annual basis.

Calculation of maximum perennial yield involves relating geohydrologic and operational factors in a quantitative form. It requires a detailed understanding of the basin's inflow terms (including precipitation, infiltration, and other recharge), and outflow terms (including exploitation, evapotranspiration, and losses to the surface and/or adjacent ground water reservoirs). The reliability of any maximum perennial yield calculation is a direct function of the accuracy and comprehensiveness of the data available for the area, and any assumptions upon which the various calculations are based.

The methodology used to calculate the maximum perennial yield relied upon:

1) Complete and correct geohydrologic data (current and historical);
2) A thorough understanding of the geologic and hydrologic parameters for the study area; and
3) Independent maximum perennial yield calculations based on two methods, thereby allowing a comparison of safe yield estimates.

The following sections describe in detail the methodology used in determining the final safe yield estimates.

6.1 Data Collection

The data collection and compilation procedures were designed to ensure data accuracy and thoroughness. For this project, data collection consisted of two phases:

1) Obtaining historic data for municipal water purveyors and private water users within the study area (data obtained from CBPW, SGPWA and DHS); and
2) Supplementing the information with data from previous investigations (geologic and hydrologic) and other agencies within the area.

A rigorous date analysis and review was conducted. Where possible, both the original field data and the resulting tabular compilations and reports were obtained. This was done in order to identify mistakes and/or inconsistencies within the original data as well as to analyze estimations used during the original data collection. Data compilation consisted of three principal phases:

- Data entry (including updating and revising GEOSCIENCE's existing City of Banning area data);
- Data checking (to minimize typographical or data entry errors); and
- Analysis of data for incongruous and statistically inconsistent data.

The analysis phase of data compilation included identification of missing data and incorporation of estimates where actual data was not available.

6.2 Field Investigations

In 2003, GEOSCIENCE conducted a field investigation to accurately determine the coordinates of all the City of Banning wells. The well locations were determined using a global positioning system (GPS) which recorded the coordinates in North American Datum (NAD) of 1983. Two GPS units were utilized in order to verify each other, and thus ensure greater accuracy.

6.3 Initial Data Analysis

Initial data analysis consisted of delineation of hydrologic subunits (watersheds) and aquifers within the study area, and preparation of the geohydrologic basemap.

The hydrologic subunits were delineated using the hydrologic modeling extension for ArcView GIS. This hydrologic modeling extension provides functionality to delineate watersheds from a DEM (a grid data source representing elevation), and calculates physical and geometric properties of the subunits. The subunits to be used for this study have been named according to the associated creek (see Figure 9).

6.4 Calculation of Maximum Perennial Yield – Banning Storage Units

To estimate the amount of ground water development possible in the Banning Storage Units (Banning, Banning Bench and Banning Canyon), two methods of calculating maximum perennial yield were used in the assessment for the City of Banning water resource area. Each method represents a varied approach, thereby resulting in a cross check on the final safe yield estimate.

The methods considered during the assessment of the maximum perennial yield were:

- Zero Net Draft Method; and
- Hill Method

The Zero Net Draft and Hill methods consider total production and its effect on water level elevations and are direct means to evaluation of the ground water conditions assessed based on extensive historical pumping and ground water level data.

6.4.1 Method of Zero Net Draft

The Method of Zero Net Draft (Chow, 1964) is a useful technique for estimating maximum perennial yield. This method involves plotting average depth to water for a selected period of time and comparing it to ground water production for the same period. If the mean ground water elevation at the beginning and end of the period is the same, the production during the period is taken as a measure of the maximum perennial yield.

6.4.2 Hill Method

The Hill Method (Chow, 1964) is a simplification of the Equation of Hydrologic Equilibrium. By plotting annual change in ground water elevations against annual draft, Hill measured the maximum perennial yield as the draft corresponding to a zero change in elevation. For the maximum perennial yield to be representative, using the Hill Method, the precipitation should approximate the long-term mean.

6.5 Calculation of Maximum Perennial Yield – Cabazon Storage Unit

The Zero Net Draft Method and the Hill Method were not used to evaluate the maximum perennial yield for the Cabazon Storage Unit because of the limited available historical pumping data and the limited availability of ground water level data representative of the entire storage unit. Therefore, an

Estimate of the maximum perennial yield for the Cabazon Storage Unit was developed using the equation of hydrologic equilibrium[10] namely:

INFLOW = OUTFLOW +/- CHANGE IN STORAGE

The hydrologic period selected for the water balance was the long term average represented by hydrologic conditions for the year 2003 (USGS, 2006). However, as data were available for the ground water pumping and recharge of treated wastewater from 2003 through 2009, these values were used. As this period was somewhat below normal, to be conservative, the highest values of pumping and average annual recharge of treated wastewater were used in the balance. As was done for the Banning Storage Units, the boundary for the Cabazon Storage Unit (used for this analysis) was obtained from the USGS - SIR 2006-5026 dated 2006.

6.5.1 Inflow terms for Water Balance

Inflow from Cabazon Basin consists of subsurface inflow from the Banning and Banning bench Storage Units, Mountain front and areal recharge from the upstream tributary drainages, and percolation of treated wastewater at the City of Banning Wastewater Treatment Plant.

6.5.1.1 Subsurface Inflow Banning Storage Unit

The underflow was calculated using the continuity equation and Darcian velocity:

$$Q=Av=Lb(K'/b')\,\Delta h / 119.34$$

where:

Q = subsurface flow [acre-ft/yr]

A = cross sectional area of flow area of flow [ft^2]

$v = K'\Delta h/b'$

L= length along boundary (ft) = 11,500 ft

b = saturated thickness (ft) = 740 ft

K'/b' = leakance[11] = 6.0×10^{-4} /day (Layer 1, at thickness 420 ft)

[10] Also known as a water balance, a hydrologic balance, or a water budget.

[11] Leakance values were obtained from USGS model values for Layers 1 and 2 along ground water barrier F6 (see Figure 39 and Table 10, USGS,2006)

$= 7.0 \times 10^{-4}$ (Layer 2 at thickness 320 ft)

Δh = change in hydraulic head across boundary (50 ft)

Using the above relationship and values, the underflow from the Banning Storage Unit to the Cabazon Storage Unit was calculated to be approximately 2,300 acre-ft/yr.

6.5.1.2 Subsurface Inflow Banning Bench Storage Unit

Underflow estimates through the alluvium at the mouth of Banning Canyon and across the fault which forms the eastern storage unit boundary between Banning Bench and Cabazon Storage Units was again, calculated using continuity equation and Darcian velocity for calculating underflow.

The underflow at the mouth of Banning Canyon at the boundary of the Cabazon Storage Unit:

$$Q = Av / 119.34,$$

where:

Q = subsurface flow [acre-ft/yr]

v = Kdh/dx

K = hydraulic conductivity (10 ft/day)[12]

dh/dx = hydraulic gradient (0.05)

A = cross sectional area of flow (60,000 ft^2)

Using the relationship and values above, the subsurface outflow from the Banning Bench Storage Unit at the mouth of Banning Canyon was estimated to be approximately 250 acre-ft/yr.

Subsurface outflow leaking across the fault at the storage unit boundary east of the mouth of Banning Canyon was estimated using the continuity equation and Darcian velocity:

$$Q=Av=Lb(K'/b')\,\Delta h / 119.34$$

[12] Table 10, USGS 2006

where: Q = subsurface flow [acre-ft/yr]

A = cross sectional area of flow (L x b)[ft^2]

v = K'Δh/b'

L= length of fault boundary (11,500 ft)

b = saturated thickness (40 ft)

K'/b' = leakance (6.5×10^{-4}/day)[13]

Δh = change in hydraulic head across boundary (40 ft)

Using the above equation and values, the underflow along the eastern portion of the Banning Bench Storage Unit to the Cabazon Storage Unit was estimated to be approximately 100 acre-ft/yr. The total underflow from the Banning Bench into the Cabazon Storage Unit was estimated to be approximately 350 acre-ft/yr (250 acre-ft/yr + 100 acre-ft/yr).

6.5.1.3 Mountain Front Runoff and Areal Recharge from Upstream Tributary Drainages

Mountain front runoff and areal recharge were estimated based on the weighted average precipitation falling within the Cabazon Storage Unit and tributary catchment areas. The Calibrated USGS model (SIR-2006-5026) estimated mountain front recharge within the USGS model area to be 2,674 acre-ft/yr over a catchment area of 17,442 acres. This is approximately 8% of the weighted average annual rainfall for the model watershed area (21.9 inches per year).

The watershed areas for the upstream drainages were determined using GIS (see Section 5.1) and are shown on Figure 9. The area of each tributary watershed is tabulated on Table 4. The weighted average annual rainfall for the total watershed areas tributary to Cabazon Storage Unit was calculated to be 130,755 acre-ft[14]. The mountain front and areal recharge contribution to the water balance was estimated as 8% of the weighted average annual precipitation over the watershed, or 10,460 acre-ft/yr.

[13] Average of 6.0×10^{-4}/day for Layer 1 and 7.0×10^{-4}/day for Layer 2.

[14] Although the Banning Canyon Watershed is tributary to the Cabazon Storage Unit, it was not included in this calculation since underflow from Banning Canyon/ Banning Bench is treated as a separate underflow inflow term to the Cabazon Storage Unit.

6.5.1.4 Infiltration of Wastewater Flows

For the years 2000 through 2009, the average annual volumes of wastewater flows of 2,655 acre-ft/yr was used as the inflow term in the water balance (See Section 3.3.3).

6.5.2 Outflow Terms for Water Balance

Outflow from Cabazon Basin consists of ground water pumping and subsurface outflow to the Indio Subbasin and outflow to the San Jacinto Tunnel.

6.5.2.1 Ground Water Pumping

Table 3 provides a tabulation of ground water pumping from the Cabazon Storage Unit, including pumping from Potrero and Millard Canyons which are tributary to the Cabazon Storage Unit. The greatest amount of pumping from the Cabazon Unit occurred in 2007 and was approximately 4,160 acre-ft. Average production for the period from 2003-2009 is approximately 3,360 acre-ft/yr. The ground water pumping values are approximate, as the Morongo Tribe does not report their annual pumping volumes.

6.5.2.2 Subsurface Outflow to Indio Subbasin

The California Department of Water Resources estimates that underflow from the Cabazon Storage Unit to the Indio Subbasin is approximately 9,000 acre-ft/yr (USGS, 1978, 1992, DWR, 2004).

6.5.2.3 Subsurface Outflow to San Jacinto Tunnel

As stated previously, although the tunnel has been constructed in bedrock and is lined with concrete, an estimated 1,500 acre-ft/year of ground water seeps into the tunnel from the west portion of the Cabazon storage unit (33% of the total 5,000 acre-ft per year tunnel seepage; Boyle, 1995; personal communication, FlowScience, 2001).

7.0 ESTIMATES OF MAXIMUM PERENNIAL YIELD

This section presents the summary of analyses and the results of the maximum perennial yield estimates for the four Storage Units included in this study:

1) Banning Storage Unit,
2) Beaumont Storage Unit,
3) Banning Bench Storage Unit, and
4) Cabazon Storage Unit.

7.1 Banning Storage Unit

The Banning Storage unit lies south of the Banning Bench Storage Unit and east of the Beaumont Storage Unit (see Figure 1). The total surface area is approximately 2,489 acres. The area is underlain by alluvial sediments, with bedrock occurring to the north in the San Bernardino Mountains. The City of Banning currently operates four active production wells within the Banning Storage Unit, Wells M10, M11, M12 and C-5. The City of Banning estimates a design capacity of 3,500 gpm for the above mentioned wells based on historical water use records (Banning, 2010).

7.1.1 Zero Net Draft Method – Banning Storage Unit

Figure 12 shows a plot of ground water levels and annual pumping from wells in the Banning Storage Unit (Wells M10, M11, M12 and C-5). A review of Figure 12 indicates that ground water levels in December 2003 were similar to levels in December 2009 (see Appendix B). During this period, the average annual ground water production was 1,582 acre-ft/year.

7.1.2 Hill Method – Banning Storage Unit

Figure 13 shows a plot of the average annual change in ground water elevations in the Banning Storage Unit Production Wells (Well M10, M11, M12 and C-5) versus annual extraction within the Storage Unit. As shown on the figure, the maximum perennial yield was calculated using the best-fit line through the data, namely:

$$y = -0.0067x + 4.5282$$

where:

y = Annual Change in Ground Water Elevation [ft]

x = Annual Extraction [acre-ft]

Using this method, the maximum perennial yield is estimated as the production for an average water level change of zero (i.e. y = 0), or 676 acre-ft/year (4.5282/0.0067).

7.2 Banning Bench Storage Unit

The Banning Bench Storage Unit is located to the north of the Banning Storage Unit (see Figure 1). The total surface area of the storage unit is approximately 3,753 acres. The City of Banning currently operates three production wells within the Banning Bench, Wells 1, 2 and 3 with a total design capacity of 3,650 gpm, based on historical water use records (Banning, 2010)..

7.2.1 Zero Net Draft Method – Banning Bench Storage Unit

Ground water levels from City of Banning Wells 1, 2 and 3 located within the Banning Bench Storage Unit were used to evaluate the historic time period when the ground water levels were similar. City of Banning Wells 1, 2 and 3 indicate that ground water elevations in January 1979 and December 2009 were similar (see Appendix B). The average annual ground water production within the Banning Bench Storage Unit during this time period was approximately 1,982 acre-ft/year (see Figure 14).

7.2.2 Hill Method – Banning Bench Storage Unit

Figure 15 shows a plot of the average annual change in ground water elevations in the Banning Bench Storage Unit Production Wells (Well 1, 2, and 3,) versus annual extraction within the Storage Unit. As shown on the figure, the maximum perennial yield was calculated from the best-fit line through the data:

$$y = -0.0046x + 8.8834$$

where:

y = Annual Change in Ground Water Elevation [ft]

x = Annual Extraction [acre-ft]

The maximum perennial yield was estimated as the annual extraction corresponding to a zero change in ground water elevation, or approximately 1,931 acre-ft/year (8.8834/0.0046).

7.3 Banning Canyon Storage Unit

The Banning Canyon Storage Unit is located to the north of the Banning Bench Storage Unit (see Figure 1). The total surface area of the Storage Unit is approximately 1,058 acres. The primary surface water drainage feature within this Storage Unit is the San Gorgonio River. The canyon bottom comprises alluvium and the canyon sides are bedrock. Most of the City of Banning's ground water is produced from the aquifer within this subunit. The City of Banning estimates a design capacity of 8,600 gpm for the above mentioned wells based on historical water use records (Banning, 2010).

7.3.1 Zero Net Draft Method - Banning Canyon Storage Unit

Representative wells within the Banning Canyon Storage Unit were used to evaluate the time period when the ground water levels were similar. Ground water level plots for City of Banning Wells 4, 5, 6, 7, 8, 9, 10, 11 and 12 indicate that the ground water elevations in January 1984 and December 2000 were similar (see Appendix B). The average annual ground water production within the Storage Unit during this time period was approximately 4,310 acre-ft/year (see Figure 16).

7.3.2 Hill Method – Banning Canyon Storage Unit

Figure 17 shows a plot of the average annual change in ground water elevations in the Banning Canyon Storage Unit Production Wells (Well 4, 5, 6, 7, 8, 9, 10, 11 and 12) versus annual extraction within the Storage Unit. As shown on the figure, the maximum perennial yield was calculated from the best-fit line through the data:

$$y = -0.0054x + 20.678$$

where:

y = Annual Change in Ground Water Elevation [ft]

x = Annual Extraction [acre-ft]

The maximum perennial yield was estimated as the annual extraction corresponding to a zero change in ground water elevation, or approximately 3,829 acre-ft/year (20.678/0.0054).

7.4 Hydrologic Budget – Cabazon Storage Unit

Ground water recharge to the Cabazon Storage Unit is obtained from precipitation infiltrating into the ground within the surface water catchments tributary to the unit and from subsurface inflow from the Banning and Banning Bench/Canyon Storage Units. Percolation of secondary treated wastewater from the City of Banning Wastewater Treatment Plant in also included as a recharge term. Outflow terms include pumping, and subsurface outflow to the Indio area.

7.4.1 Inflow Terms – Cabazon Storage Unit

Ground water recharge to the Cabazon Storage Unit is from precipitation infiltrating within surface water catchments tributary to the unit as well as subsurface inflow from the Banning and Banning Bench/Canyon Storage Units. Percolation of secondary treated wastewater from the City of Banning's Wastewater Treatment Plant in also included as a recharge term.

7.4.1.1 Inflow Terms

- Subsurface inflow from the Banning Storage Unit was calculated using hydrologic parameters provided in USGS (2006) for 2003 average year conditions (approximately 2,300 acre-ft/yr).
- Subsurface inflow from the Banning Bench/Canyon Storage Units (was estimated from an underflow calculation through the alluvium of Banning Canyon) (approximately 350 acre-ft/yr).
- Mountain front runoff and areal recharge to all watersheds tributary to the Cabazon Storage Unit was estimated based on 8% of the weighted average annual precipitation for the Cabazon Storage Unit and tributary drainage areas (10,460 acre-ft/yr).
- Percolation of treated wastewater (i.e. secondary Effluent from the City of Banning Wastewater Treatment Plant between 1999 - 2009 (2,655 acre-ft/yr).

TOTAL AVERAGE INFLOW = approximately 15,765 acre-ft/yr

7.4.2 Outflow Terms – Cabazon Storage Unit

Ground water outflow from the Cabazon Storage Unit includes ground water pumping, subsurface outflow to the Indio Subbasin, and subsurface outflow to the San Jacinto Tunnel. The ground water outflow terms are summarized below:

7.4.2.1 Outflow Terms

- Annual ground water pumping for the Cabazon Storage Unit, and Millard and Potrero Canyons (3,460 acre-ft/yr)[15].
- Subsurface outflow to the Indio Subbasin (9,000 acre-ft/yr).
- Outflow to the San Jacinto Tunnel (1,500 acre-ft/yr).

TOTAL AVERAGE OUTFLOW = 14,600 acre-ft/yr

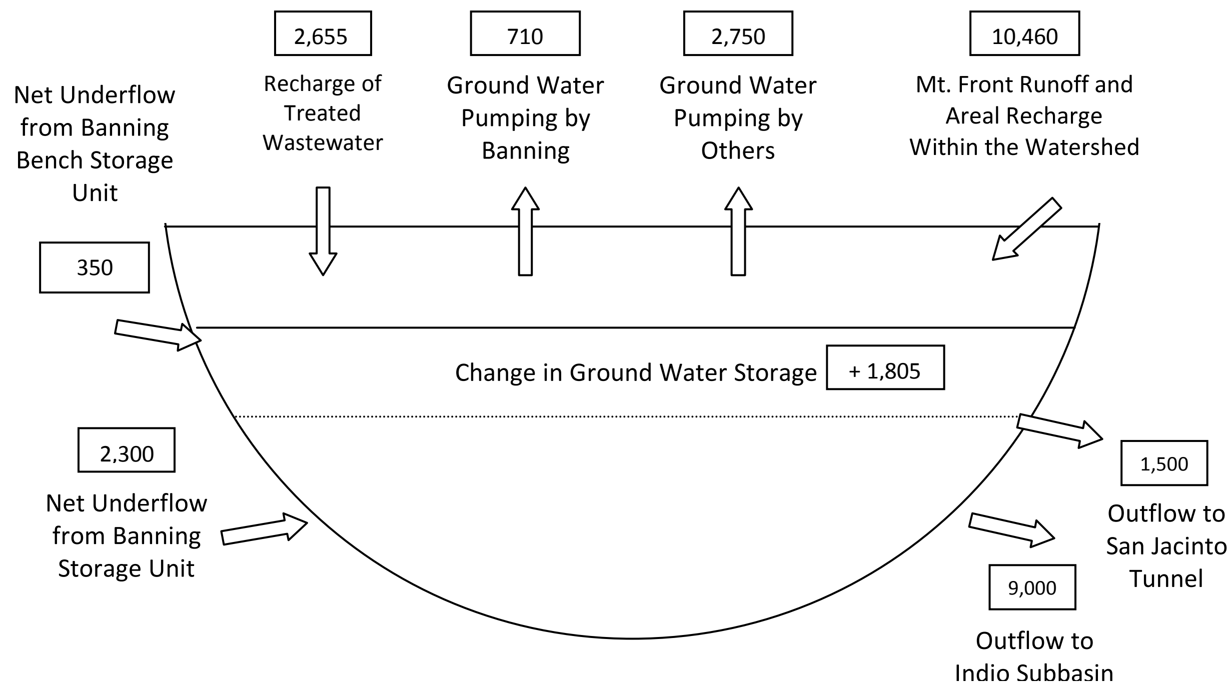
Hydrologic Budget - Cabazon Storage Unit
Acre-ft/yr

[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]
INFLOW					OUTFLOW			
Underflow from Banning Storage Unit	**Underflow from Banning Bench Storage Unit**	**Mountain Front Runoff and Areal recharge**	**Recharge of Treated Wastewate r**	**Total Inflow**	**Subsurface Outflow to Indio Subbasin and the San Jacinto Tunnel**	**Ground Water Pumping**	**Total Outflo w**	**Average Annual Change in Storage**
2,300	350	10,460	2,655	15,765	10,500	3,460	13,960	1,805

Note:
[1] Determined from 2003 USGS Modeled outflow for the Banning Storage Unit.
[2] Calculated underflow across the storage unit boundary at Banning Canyon and underflow across the mountain front fault along the storage unit boundary.
[3] Basin recharge estimated as 8% of the average annual precipitation in the Cabazon Storage Unit and the upstream watersheds.
[4] Percolation of secondary treated wastewater from the City of Banning Wastewater Treatment Plant.
[5] = [1] + [2] + [3] + [4].
[6] DWR Bulletin 118 *San Gorgonio Pass Ground Water Basin 2004*.
[7] Average ground water extraction from the Cabazon Storage Unit, and Millard and Potrero Canyons.
[8] = [6] + [7].
[9] = [5] - [8].

[15] Based on the average pumping during the period 2003 to 2009.

Average Hydrologic Balance
Cabazon Storage Unit
(Acre-ft/yr)



7.4.3 Change in Storage

Review of historical ground water levels and historical precipitation for the Cabazon Storage Unit indicates that ground water levels closely follow the pattern of rainfall (see Figure 10 and Hydrographs in Appendix B). Ground water level records for Wells 3S/3E–7M1 and 8M1 for periods ranging from 1946 through 2009 (which includes wet, dry and average precipitation) show that ground water levels decline during dry periods and rise during wet periods. Overall, the long-term change in ground water in storage (based on the hydrographs and precipitation – see Appendix B) appears to remain the same (i.e. no long-term declines or increases).

7.4.4 Additional Water Supply from the Cabazon Storage Unit

Available water supply from the Cabazon Storage Unit above existing production is approximately 1,805 acre-ft/yr (on average). The City of Banning Well C-6 annually extracts approximately 710 acre-ft/yr on average since it came online in 2004. The City estimates that the total design capacity for Well C-6 is 900 gpm or 1,450 acre-ft/yr based on historical production records (City of Banning, 2010). If the City utilizes Well C-6 at full capacity (1,450 ac-ft/yr) an additional 350 acre-ft/yr is available if an additional well is constructed. The closest non-City of Banning pumping well to Well R-1 is located approximately one mile away. Based on a storage coefficient of between 0.15 and 0.17 and a transmissivity of 49,900 gpd/ft[16], additional pumping from R-1 could result in an drawdown at the closest well of approximately 1.2 to 1.4 feet after one year of continuous pumping from R-1. This additional drawdown would not result any significant impact to the well or operation of the well. If an additional well is constructed to maximize use of the Cabazon Storage Unit for ground water development, the well can be located so as to not result in impacts to existing wells.

Additional water supply for the Cabazon Storage Unit may also be developed by reducing subsurface outflow to the Indio Subbasin. This could be achieved using a series of wells which changes hydraulic gradients near the eastern Cabazon Storage Unit boundary and reduces ground water flowing eastward to the Indio Subbasin. For example, if hydraulic control is achieved whereby an average subsurface outflow to the Indio Subbasin is reduced by 25%, an additional 2,250 acre-ft/yr of potential production could be available in the Cabazon Storage Unit. This amounts to an additional annual extraction of approximately 4,055 acre-ft/yr above the existing production without causing a long-term decline in storage.

[16] GEOSCIENCE, 1991

8.0 ANTICIPATED FUTURE WATER SUPPLY BEAUMONT BASIN

Pursuant to the Beaumont Basin Judgment (Superior Court of the State of California for the County of Riverside, 2004), the City has the right to pump 5,910 acre-ft annually (see Appendix D) until the year 2014 at which time the Beaumont Basin Watermaster shall re-evaluate the safe yield of the basin. The allotted 5,910 acre-ft/yr pumping rights to the City of Banning is comprised of:

- 882 acre-ft/yr which is 31.43% of the remainder of the Beaumont Basin safe yield (8,650 acre-ft/yr) is an initial estimate of appropriative rights (see Column 4 of Exhibit C of the Judgment) after appropriations by overlying producers (5,845 acre-ft/yr) and,
- 5,029 acre-ft/yr which is 31.43% of the controlled overdraft/temporary surplus or annual operating yield of 16,000 acre-ft/yr for a total of 160,000 acre-ft over the ten year period of 2004 to 2014.

If the overlying producers increase or reduce production in the future, or if water districts provide direct service to the appropriators within their service areas, then the City's 882 acre-ft/yr will change. In the Sixth Annual Report of the Beaumont Basin Watermaster, dated April 2010, it was reported that less water has been extracted from the basin than anticipated. In addition, the Beaumont Basin Watermaster Biennial Engineer's Report – July 2003 through June 2008, states that the estimated safe yield of the basin may be approximately 10,290 acre-ft/yr[17] rather than the 8,650 acre-ft/yr, which was stipulated as the initial estimate in the Judgment for the first 10-year period. However, a change in the safe yield for Beaumont Storage Unit can only occur after re-evaluation of the basin by the Watermaster scheduled every 10 years.

Table 5 of the Sixth Annual Beaumont Basin Watermaster Report, 2010 states that the City of Banning has an allocation of unused overlying water of 1,405, 1,645, 1,659, 1,618, 1,830, and 1,805 acre-ft for the years 2008/09, 2009/10, 2010/11, 2011/12, 2012/13, and 2013/14 respectively. These values are derived from 31.43% of the actual amount produced by the overlying producers from the period 2003/04 to 2007/08 (5 years) and applied at the beginning of the subsequent 5- year period. The

[17] Page 4-4, Biennial Engineers Report – July 2003 through June 2008, Beaumont Basin Watermaster

following table provides an estimate of the projected volume of the City of Banning ground water in storage within the Beaumont Basin which is their estimated production right.

The City of Banning's
Ground Water in Storage within the Beaumont Basin (Production Right)

Year	Appropriative Rights After Overlying Producers[1]	Controlled Overdraft of Annual Operating Yield[2]	Recharge of SWP[3]	Banning Production from Beaumont Storage Unit[4]	Transfers Among Appropriators[5]	Estimated Total Water in Storage[6] (Production Right)
2004	0	5,029	0	3,605		1,424
2005	0	5,029	0	1,879		4,575
2006	0	5,029	0	2,012	1,500	9,092
2007	0	5,029	0	2,962		11,159
2008	0	5,029	0	3,417		12,771
2009	1,492	5,029	1,200	2,355		18,138
2010	1,645	5,029	1,200	1,372		24,640
2011	1,659	5,029	1,298	2,514		30,111
2012	1,618	5,029	1,298	2,514		35,541
2013	1,830	5,029	1,298	2,514		41,184
2014	1,805	0	2,595	2,514		43,069
2015	1,805	0	2,595	2,514		44,955
2016	1,805	0	2,595	2,514		46,841
2017	1,805	0	2,595	2,514		48,726
2018	1,805	0	2,595	2,514		50,612
2019	1,805	0	2,595	2,514		52,498
2020	1,635	0	2,595	2,514		54,214
2021	1,613	0	2,595	2,514		55,907
2022	1,591	0	2,595	2,514		57,579
2023	1,569	0	2,595	2,514		59,229
2024	1,547	0	2,595	2,514		60,856
2025	1,478	0	2,595	2,514		62,415
2026	1,456	0	2,595	2,514		63,952
2027	1,434	0	2,595	2,514		65,466
2028	1,411	0	2,595	2,514		66,958
2029	1,389	0	2,595	2,514		68,428
2030	1,328	0	2,595	2,514		69,837
2031	1,306	0	2,595	2,514		71,223
2032	1,284	0	2,595	2,514		72,588
2033	1,262	0	2,595	2,514		73,931
2034	1,240	0	2,595	2,514		75,251
2035	1,194	0	2,595	2,514		76,526

- It should be noted that there is a discrepancy between the reported City of Banning unused overlying water right allocation in 2009 as reported by the Sixth Annual Beaumont Basin Watermaster Report (1,405 acre-ft) and the value of 1,492 acre-ft as listed in the Draft Beaumont Management Zone Maximum Benefits Program Modeling Scenarios, 2011 Appendix A-3.

1 Projected allocation of pumping rights per Appendix A-3 ("Projected Allocation of Pumping Rights for the 2004 Beaumont Basin Judgment") of the Draft Beaumont Management Zone Maximum Benefits Program Modeling Scenarios, prepared by Wildemuth Environmental, Inc. dated March 18, 2011.

[2] Controlled overdraft assigned by the Beaumont Basin Judgment for the ten year period 2004 through 2012 (Exhibit C in Appendix D).

[3] State Water project purchases reported by Watermaster for 2009 year. Values for purchases for 2010 year provided by the City of Banning. Projected Purchases (2011-2035) assumed to be 25% of annual delivery to SGPWA anticipated by the SWP Reliability Report (60% of the maximum annual delivery of 8,650 acre-ft per year until 2013, when EBXII is assumed be online, 17,300 will be accessible).

[4] City of Banning production as reported by the City of Banning for years 2004-2010 which includes water received from BCVWD, extracted from the Beaumont Storage Unit. For years 2011 through 2020, City of Banning pumping is assumed at the average annual pumping value 2,514 acre-ft/yr.

[5] Transfer reported by Watermaster in the Sixth Annual Report of the Beaumont Basin Watermaster dated 2010.

[6] Sum of columns 1, 2, 3 and 5 minus column 4, the product is added to the previous year Estimated Total Water in Storage.

For the purposes of providing projected water supplies from the Beaumont Basin, it is anticipated that the City will extract an average of 2,514 ac-ft/yr, (average City production since adjudication in 2004, as reported by the City of Banning, 2011) however, as demand increases, additional water will be extracted as needed from the Beaumont Storage Unit to meet demand.

Watermaster is required by law[18] to re-determine the safe-yield of the Beaumont basin at least every 10 years beginning 10 years after the date of the entry of the Judgment (2004) or at the year 2014. Pursuant to the Judgment, the City is allowed to pump sufficient water from the Beaumont Basin in order to meet its water demand. Should this amount exceed the City's rights, the Beaumont Basin Watermaster has an obligation to replenish the overproduction.

8.1 The City of Banning's Current and Projected Ground Water Supply

The following table summarizes the current and projected available water supply from the Banning, Cabazon and Beaumont Storage Units available to the City of Banning as well as projected available water supply in 2014. Available water supply for the Beaumont Basin beyond 2014 will be a function of:

1. Ground water recharge credit,
2. The amount of pumping by overlying producers, and
3. The remaining operating yield available to the City.

[18] Beaumont Basin Judgment, VI Administration (5)(Y)

However, the following table provides an estimate of potential water supply from the Beaumont Storage Unit based on accruing an amount of ground water in storage from the un-used portion of ground water from adjudicated rights in the Beaumont Storage Unit.

CITY OF BANNING CURRENT AND PROJECTED GROUND WATER SUPPLY

(AVERAGE YEAR CONDITIONS)

Storage Unit	Year 2010	Year 2015
Banning	1,130	1,130
Banning Bench	1,960	1,960
Banning Canyon	4,070	4,070
Cabazon	2,515[19]	2,515
Beaumont	2,514[20]	2,514
Beaumont Basin - Recharge (SWP)	**1,200**[21]	**2,595**[22]
Total Ground Water Supply Per Year	**13,368**	**14,793**

[19] Cabazon Production includes approximately 1,805 acre-ft/yr of potential additional pumping reported in this technical memorandum and 710 acre-ft/yr which has been the average annual production from the City of Banning Well C-6 (as reported by the City of Banning)
[20] City of Banning production as reported by Watermaster in the Sixth Annual Report of the Beaumont Basin Watermaster dated 2010. For years 2011 through 2035, City of Banning pumping is assumed at the average annual pumping value (2,514 acre-ft/yr).
[21] 2010 City of Banning purchases of SWP water from SGPWA to recharge in the BCVWD spreading grounds on Noble Creek.
[22] Projected values assume Banning will receive 25% of SWP water received by the SGPWA, DWR SWP Reliability Report estimates SGPWA will receive 60% of the maximum annual delivery. SGPWA is entitled to 8,650 acre-ft per year until 2013 (when EBXII is assumed to be online) when the full allotment of 17,300 acre-ft/yr can be utilized.

9.0 SUMMARY AND RECOMMENDATIONS

9.1 Summary

The table below provides a summary of the available water supply to the City of Banning. The water supply from the Banning Storage Units (Banning, Banning Bench, and Banning Canyon) represents the maximum perennial yield for those storage units since the City of Banning is the major producer in those storage units. The available water supply from the Cabazon Storage unit represents additional water supply that can be developed from the storage unit as determined from this study (see Section 7.4).

AVAILABLE WATER SUPPLY FROM BANNING STORAGE UNITS
AND CABAZON STORAGE UNIT
Acre-ft/year

Storage Unit	Zero Net Draft	Hill Method	Hydrologic Budget	Average
Banning	1,580	680	N/A	1,130
Banning Bench	1,980	1,930	N/A	1,960
Banning Canyon	4,310	3,830	N/A	4,070
Total of All Banning Storage Units	**7,870**	**6,440**	**N/A**	**7,160**
Cabazon	**N/A**	**N/A**	**2,515**[23]	**2,515**

[23] The water supply available to the City of Banning from the Cabazon Storage Unit equals average production from Well C-6 (710 acre-ft/yr) plus the average annual change in storage of 1,805 acre-ft/yr.

- The average maximum perennial yield for the Banning Storage Units (Banning, Banning Bench and Banning Canyon) is approximately 7,160 acre-ft/yr. Production within these Storage Units for 2009 is approximately 6,500 acre-ft.
- The Hydrologic Budget for the Cabazon Storage Unit indicates that approximately 1,805 acre-ft/yr above current ground water production might be available for future development. Current production within the Cabazon Storage Unit is approximately 3,460 acre-ft for 2009, of which 710 acre-ft/yr is by the City of Banning.
- Ground water level records taken from the Cabazon Storage Unit for periods ranging from 1946 through 2009 (which includes wet, dry and average precipitation) show that ground water levels decline during dry periods and rise during wet periods.
- Overall, the long-term change in ground water in storage for the Cabazon Storage Unit (based on the hydrographs and precipitation) appears to remain the same (i.e. no long-term declines or increases).
- Further ground water development can take place in the Cabazon Storage Unit to achieve hydraulic control to decrease the amount of outflow to the Indio Subbasin.
- The Beaumont Basin Watermaster report, dated April 2010, reported that less water has been extracted from the basin than anticipated. An estimated safe yield of the basin may be approximately 10,290 acre-ft/yr, which could result in a greater allocation of water to the City of Banning.
- The amount of ground water in storage within the City of Banning area, not including the Beaumont Storage Unit which falls within the City of Banning water resource area, is estimated to be approximately between 1.1 – 1.2 million acre-ft.

9.2 Recommendations

- To increase the available water supply, continuing and/or increasing the diversion of water from the Whitewater River into the Banning Canyon from the Flume (Canyon subunit) should be pursued. A maximum water right of 13.26 cfs exists for the diversion.
- Diversions to Banning Canyon should be gauged as well as diversion from the San Gorgonio River into the off-stream recharge basins in Banning Canyon.

- The ground water levels in Well R-1 should be included as part of the monitoring effort of the City of Banning. In addition, ground water quality data should be collected on an annual basis to allow development of ground water quality trends in this area of the Cabazon Storage Unit.
- Ground water pumping should be managed in order to develop a continuing history of ground water extractions in the unadjudicated storage units of the San Gorgonio Pass Ground Water Basin (Banning, Banning Bench, Banning Canyon, and Cabazon Storage Units).
- Potential capture of stormwater run-off from mountain front watersheds as well as capture of urban run-off should be included in long-term planning for development of additional water supply.
- For the future, managing the ground water basin through an annual ground water audit should be considered for long-term planning and operation. This process involves evaluating ground water level trends, production rates, ground water quality or other aquifer/well/pump considerations from the previous year (through use of a on-going ground water monitoring and data collection system). The water audit should be performed six months prior to the start of the water accounting year, and information from this audit will be used to make recommendations for pumping in the following year.[24] This management approach focuses more on maintaining ground water levels within acceptable limits rather than maintaining pumping within a predetermined safe yield; although refinement of the safe yield is part of the audit process.
- Future ground water management strategy should include development of a ground water model to allow accurate simulation of ground water flow and ground water quality (including potential impacts by recharge of recycled water) in the City of Banning ground water resource area.

[24] Typical water accounting years may be the "actual" water year, October 1 to September 30 or, fiscal years such as July 1 to June 30.

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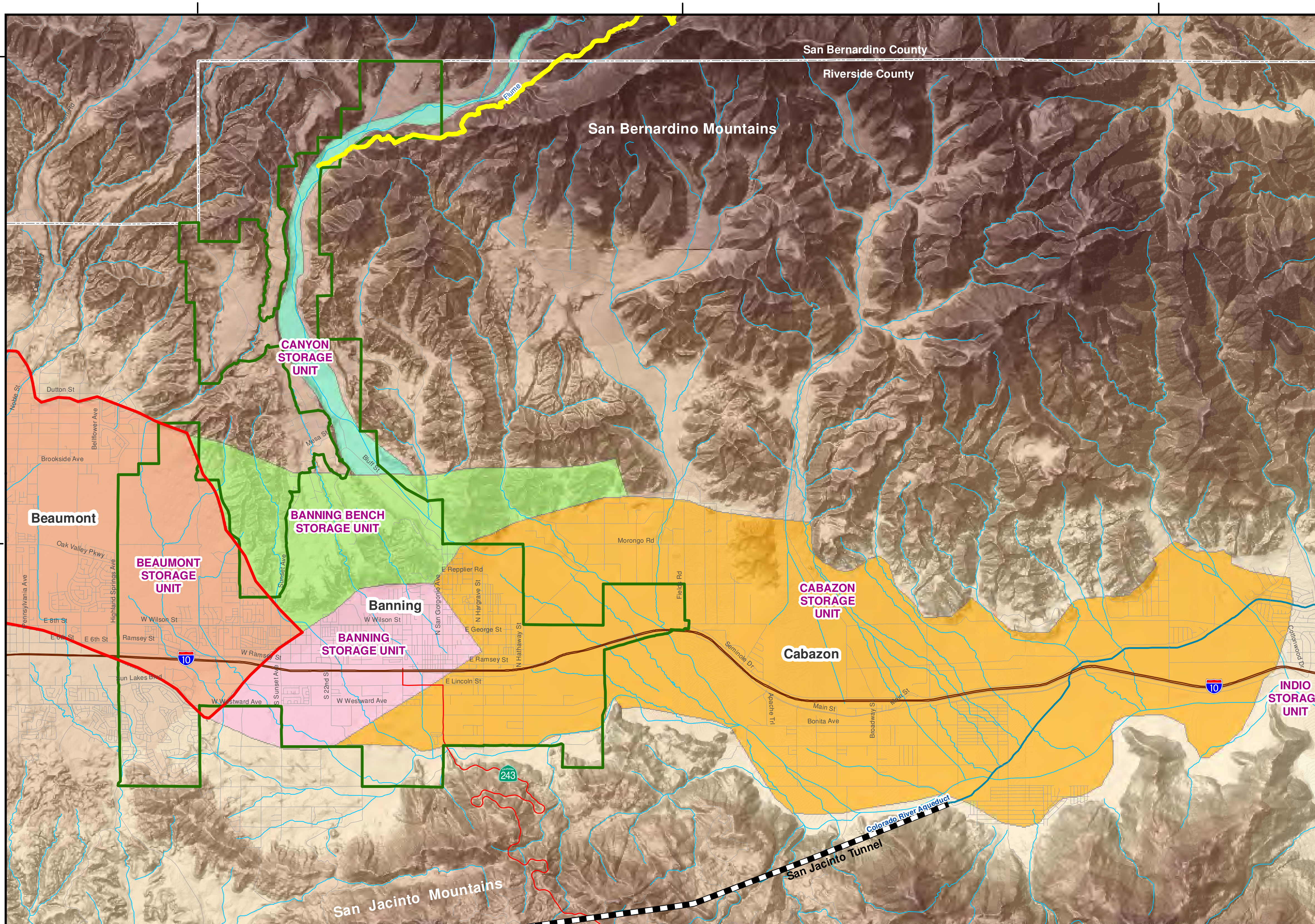
FIGURES

GEOSCIENCE

CITY OF BANNING

MAXIMUM PERENNIAL YIELD ESTIMATES FOR THE BANNING AND CABAZON STORAGE UNITS, AND AVAILABLE WATER SUPPLY FROM THE BEAUMONT BASIN

REGIONAL SETTING



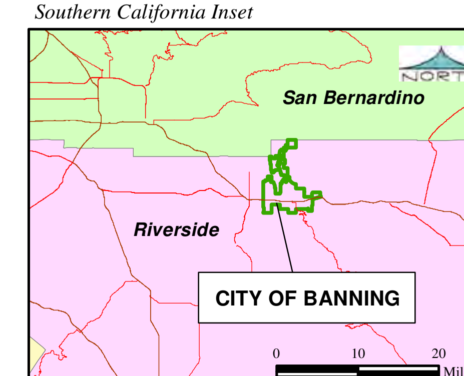
EXPLANATION

- City of Banning Boundary
- County Boundary
- Colorado River Aqueduct
- San Jacinto Tunnel

Ground Water Storage Unit Boundary (Source: USGS, 2006)

- Banning Bench
- Banning
- Beaumont
- Cabazon
- Canyon
- SCE Trans-Basin Diversion from the Upper Whitewater River Watershed

Southern California Inset



29-Mar-11

Prepared by: DWB

Map Projection: UTM 1927 (Zone 11)

Source of Data:
Faults Modified from R.M. Bloyd, Jr.
USGS Water Supply Paper 1999-D, Plate 1, 1971., and
USGS Scientific Investigation Report 2006-5026, Figure 2, 2006.

NORTH

0 3,500 7,000 Feet

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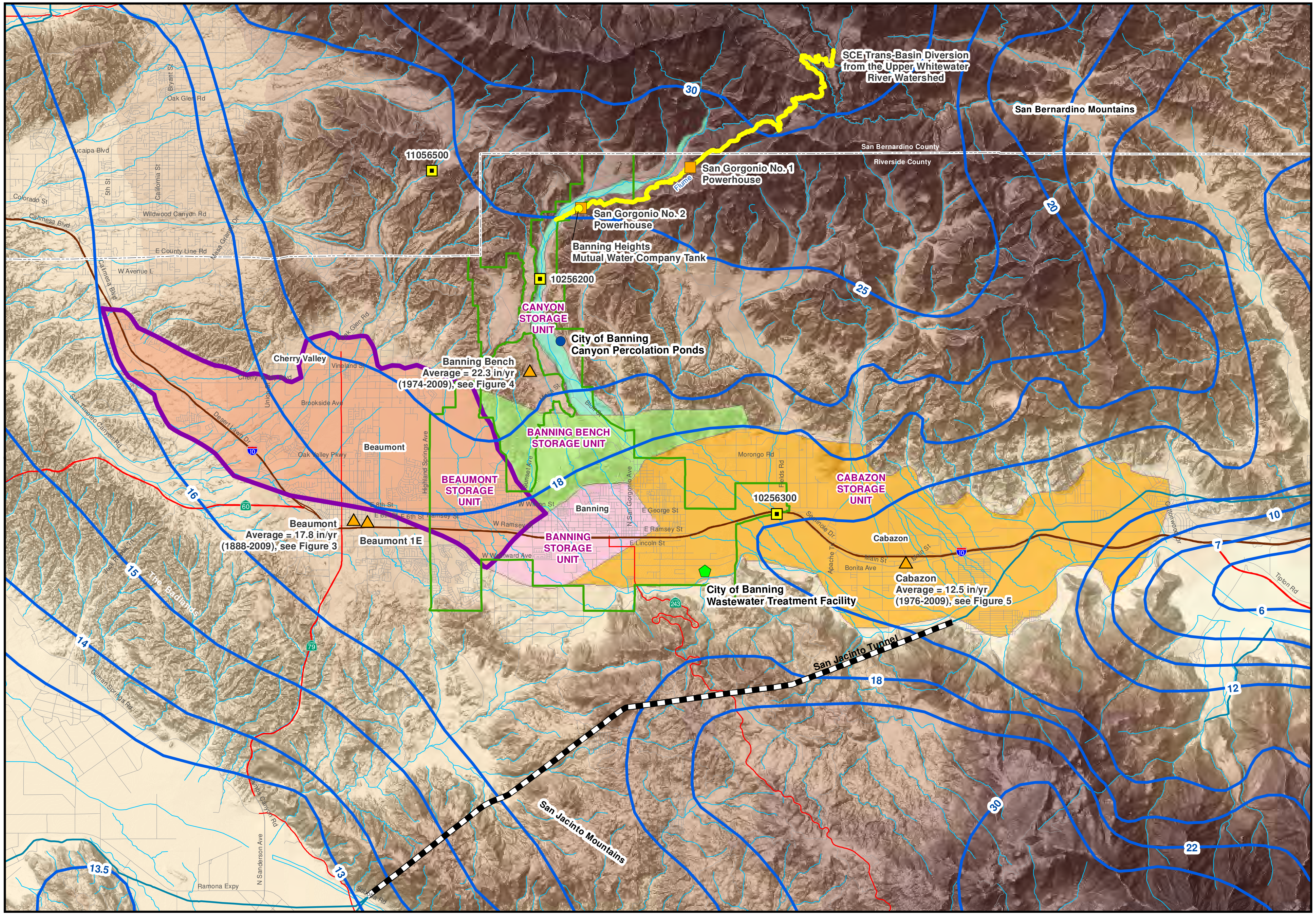
Figure 1

GIS_proj/city_of_banning_per_yield_3-11/0_Fig_1_regional_setting_3-11.mxd

CITY OF BANNING

MAXIMUM PERENNIAL YIELD ESTIMATES FOR THE BANNING AND CABAZON STORAGE UNITS, AND AVAILABLE WATER SUPPLY FROM THE BEAUMONT BASIN



AVERAGE ANNUAL ISOHYETALS PRECIPITATION AND GAGING STATIONS

EXPLANATION

14 — Mean Annual Precipitation (inches)

Note: Isohyetal map was generated using data from water years 1955-56 to 1979-1980 (Riverside County Flood Control and Water Conservation District, 1983).

Note: See Appendix A for annual precipitation and Figures 3-5 for cumulative departure from mean precipitation for Beaumont Weather Stations.

Cabazon — Riverside County Flood Control and Water Conservation District Weather Station

10256200 — USGS Gaging Station and Site Number

City of Banning Boundary

Ground Water Storage Unit Boundary (Source: USGS, 2006)

- Banning Bench
- Banning
- Beaumont
- Cabazon
- Canyon

Adjudicated Ground Water Boundary

County Boundary

Aqueduct

San Jacinto Tunnel

SCE Trans-Basin Diversion from the Upper Whitewater River Watershed

29-Mar-11

Prepared by: DWB

Map Projection: UTM 1927 (Zone 11)

NORTH

0 5,500 11,000 Feet

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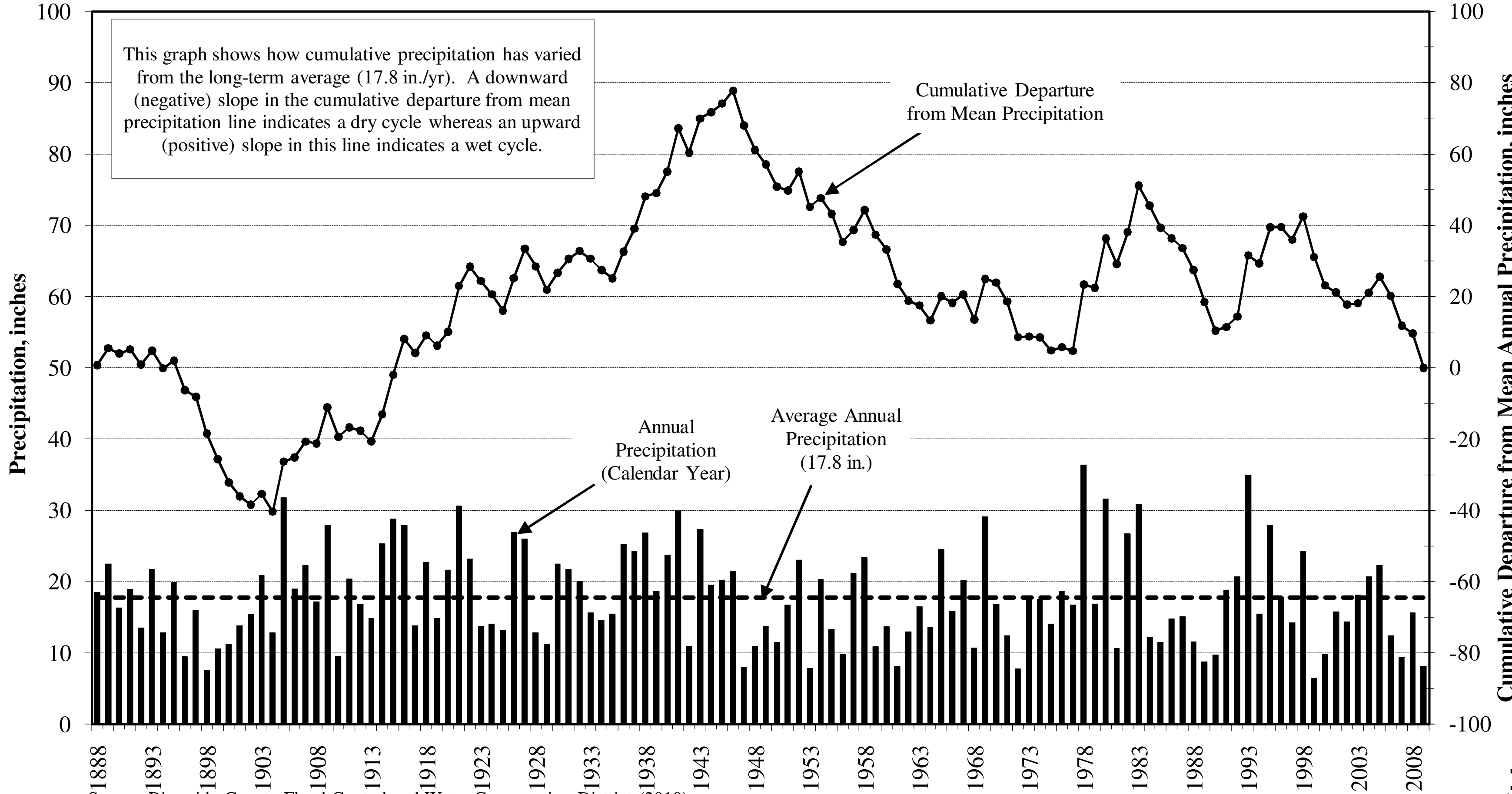
Figure 2

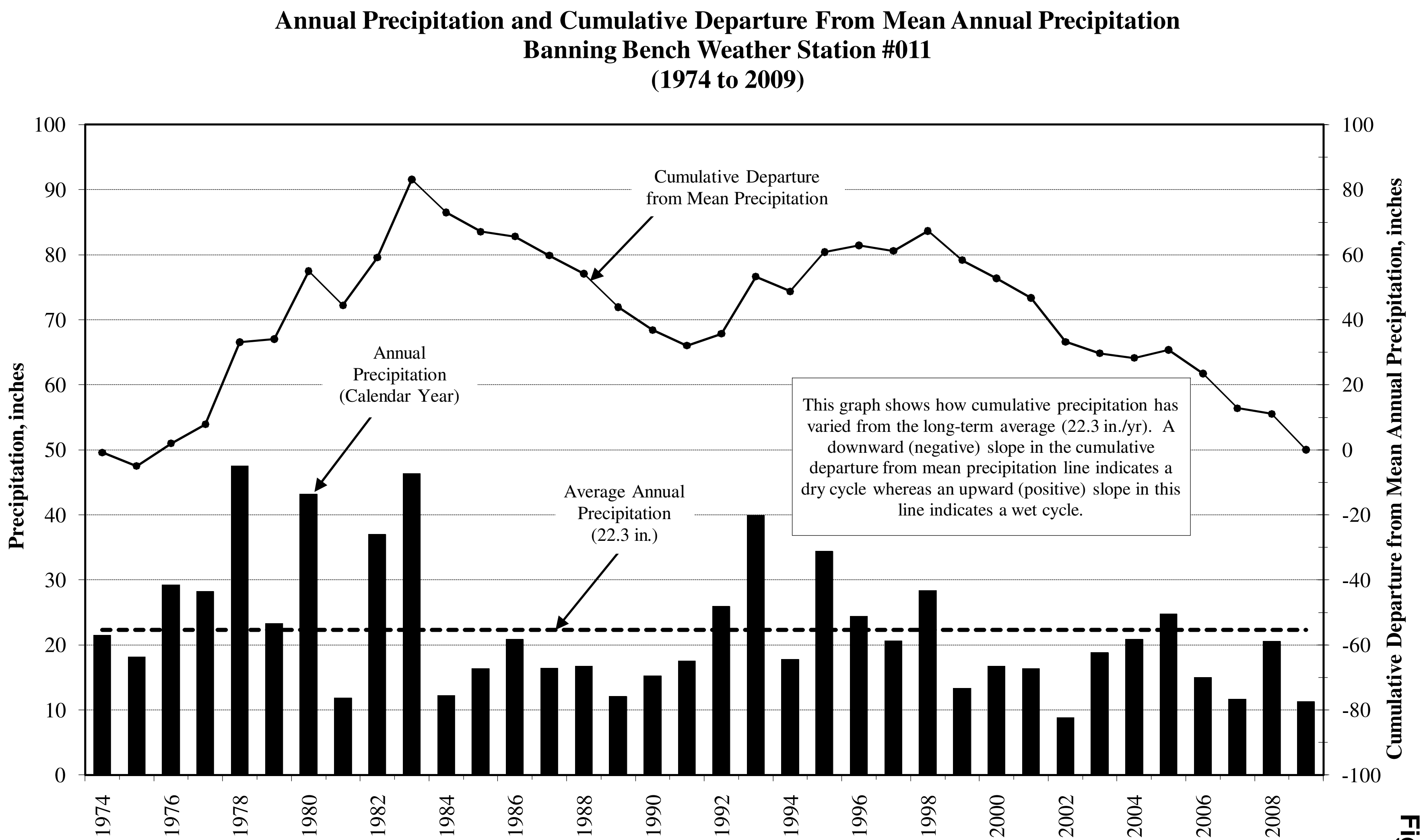
GIS_proj/city_of_banning_per_yield_3-11/0_Fig_4_isohyetals_3-11.mxd

Annual Precipitation and Cumulative Departure From Mean Annual Precipitation
Beaumont Weather Station #013
(1888 to 2009)



Source: Riverside County Flood Control and Water Conservation District (2010).
Note: Data are presented in calendar years.

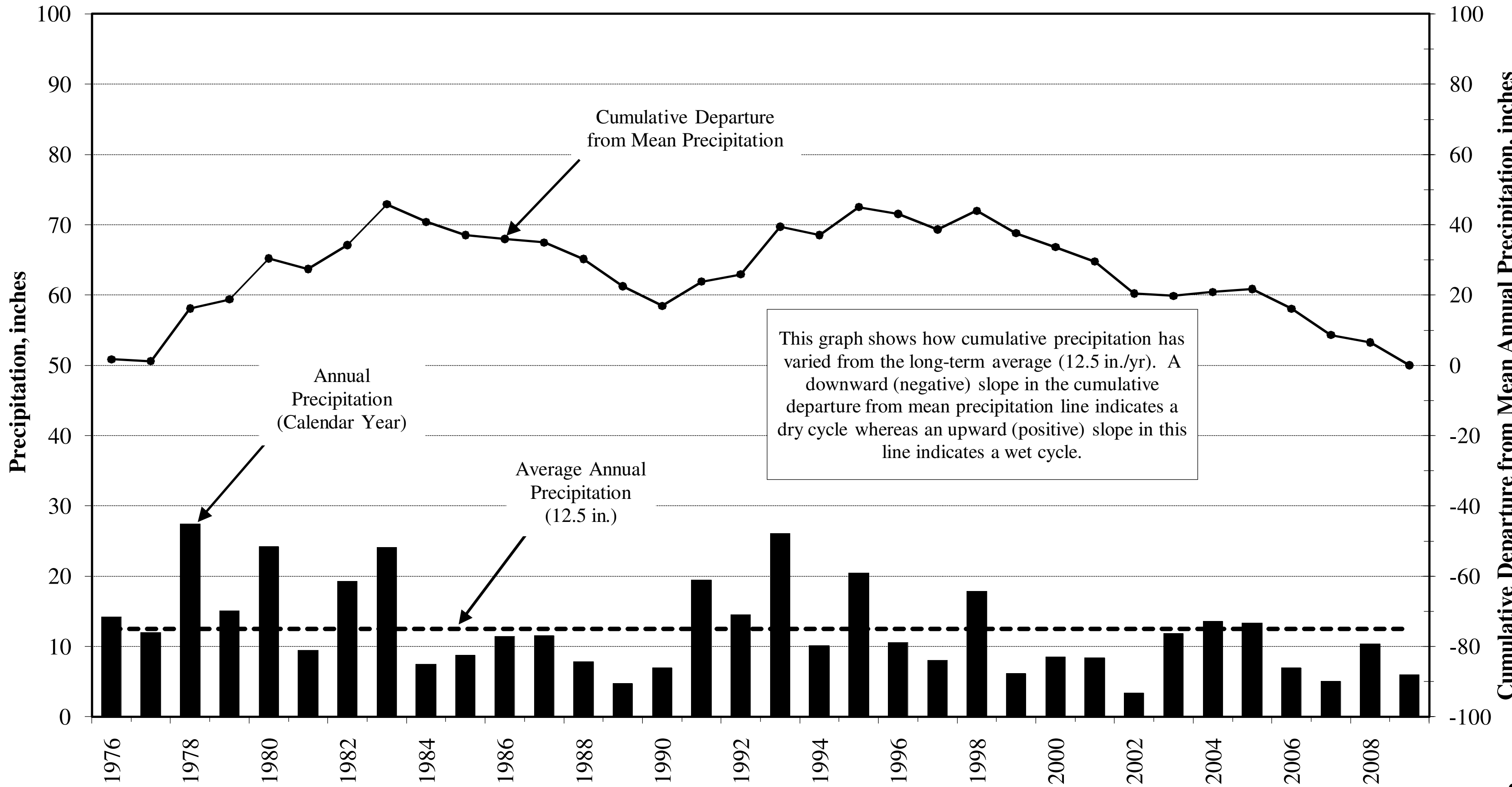
Figure 3



Source: Riverside County Flood Control and Water Conservation District (2010).
Note: Data are presented in calendar years.

Figure 4

Annual Precipitation and Cumulative Departure From Mean Annual Precipitation
Cabazon Weather Station #025
(1976 to 2009)

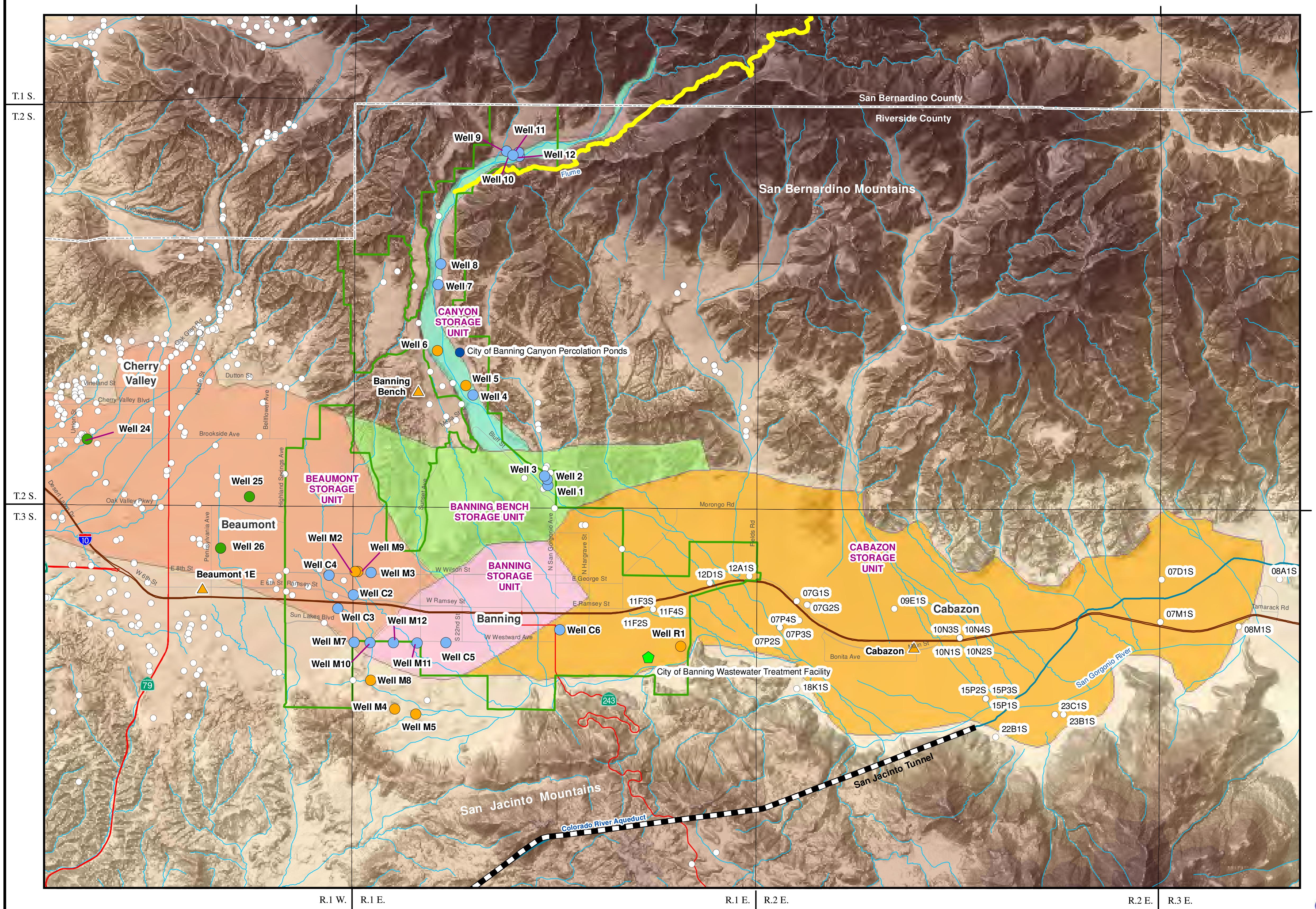


Source: Riverside County Flood Control and Water Conservation District (2010).
Note: Data are presented in calendar years.

Figure 5

CITY OF BANNING

MAXIMUM PERENNIAL YIELD ESTIMATES FOR THE BANNING AND CABAZON STORAGE UNITS, AND AVAILABLE WATER SUPPLY FROM THE BEAUMONT BASIN



WELL LOCATIONS

EXPLANATION

- Active City of Banning Well
- Inactive City of Banning Well
- Active Wells Co-Owned by the City of Banning and Beaumont Cherry Valley Water District
- Other Wells
- Cabazon — Riverside County Flood Control and Water Conservation District Weather Station
- City of Banning Boundary
- Colorado River Aqueduct
- San Jacinto Tunnel

Ground Water Storage Unit Boundary (Source: USGS, 2006)

- Banning Bench
- Banning
- Beaumont
- Cabazon
- Canyon
- SCE Trans-Basin Diversion from the Upper Whitewater River Watershed

29-Mar-11

Prepared by: DWB

Map Projection: UTM 1927 (Zone 11)

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Figure 6

GIS_proj/city_of_banning_per_yield_3-11/0_Fig_6_well_locations_3-11.mxd

City of Banning
Maximum Perennial Yield Estimates for the Banning and Cabazon Storage Units, and Available Water Supply From the Beaumont Basin

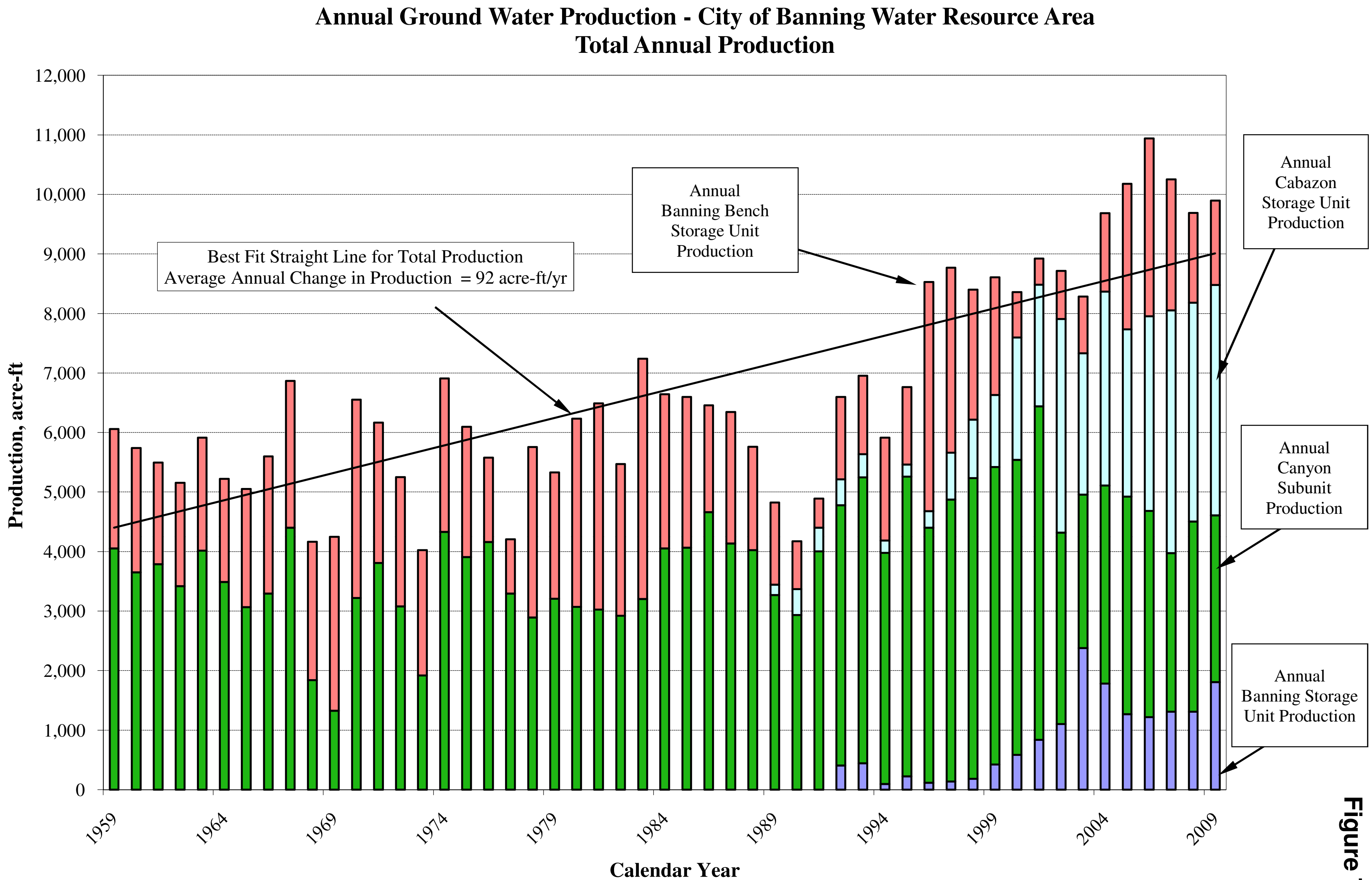


Figure 7a

City of Banning
Maximum Perennial Yield Estimates for the Banning and Cabazon Storage Units, and
Available Water Supply From the Beaumont Basin

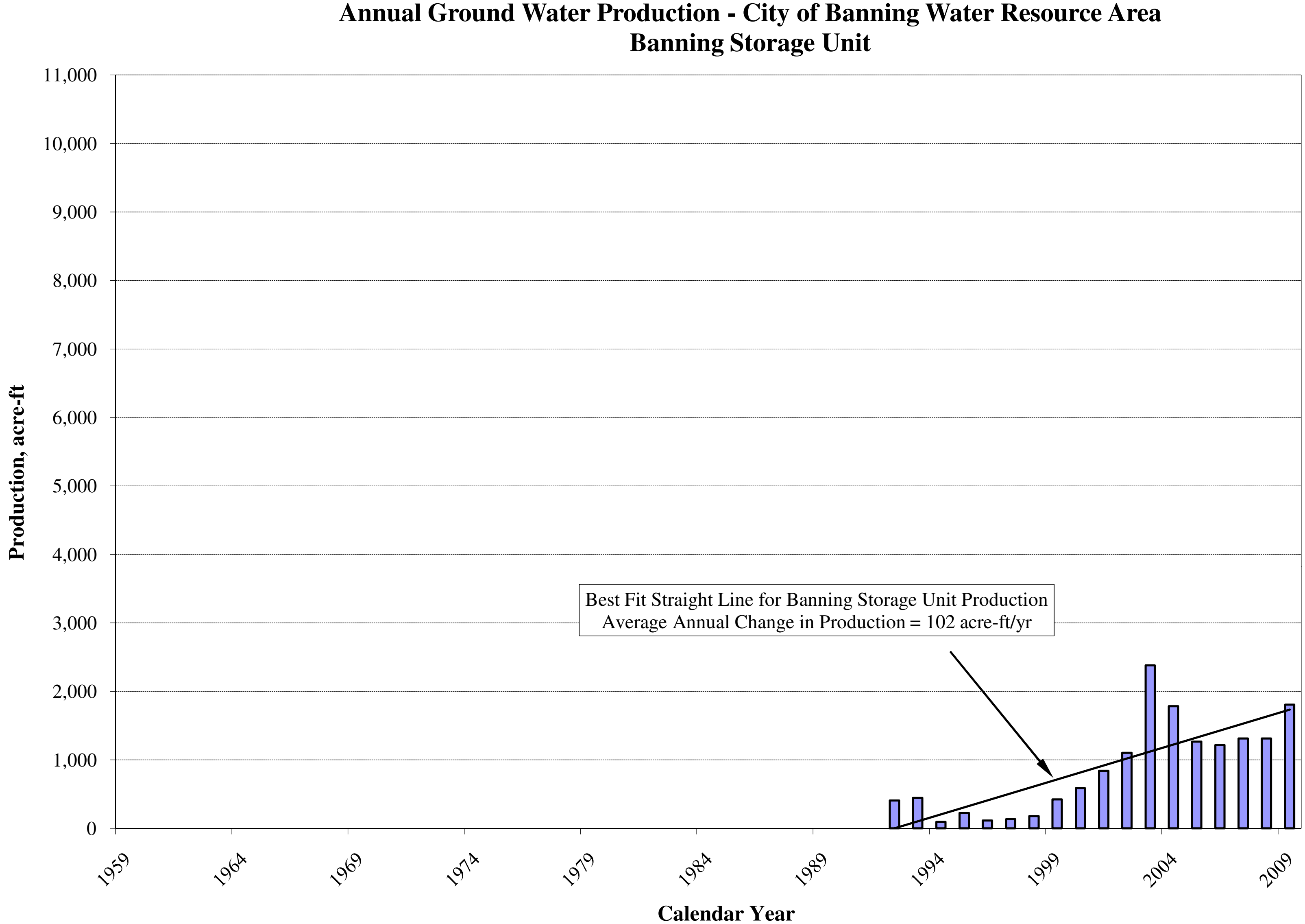


Figure 7b

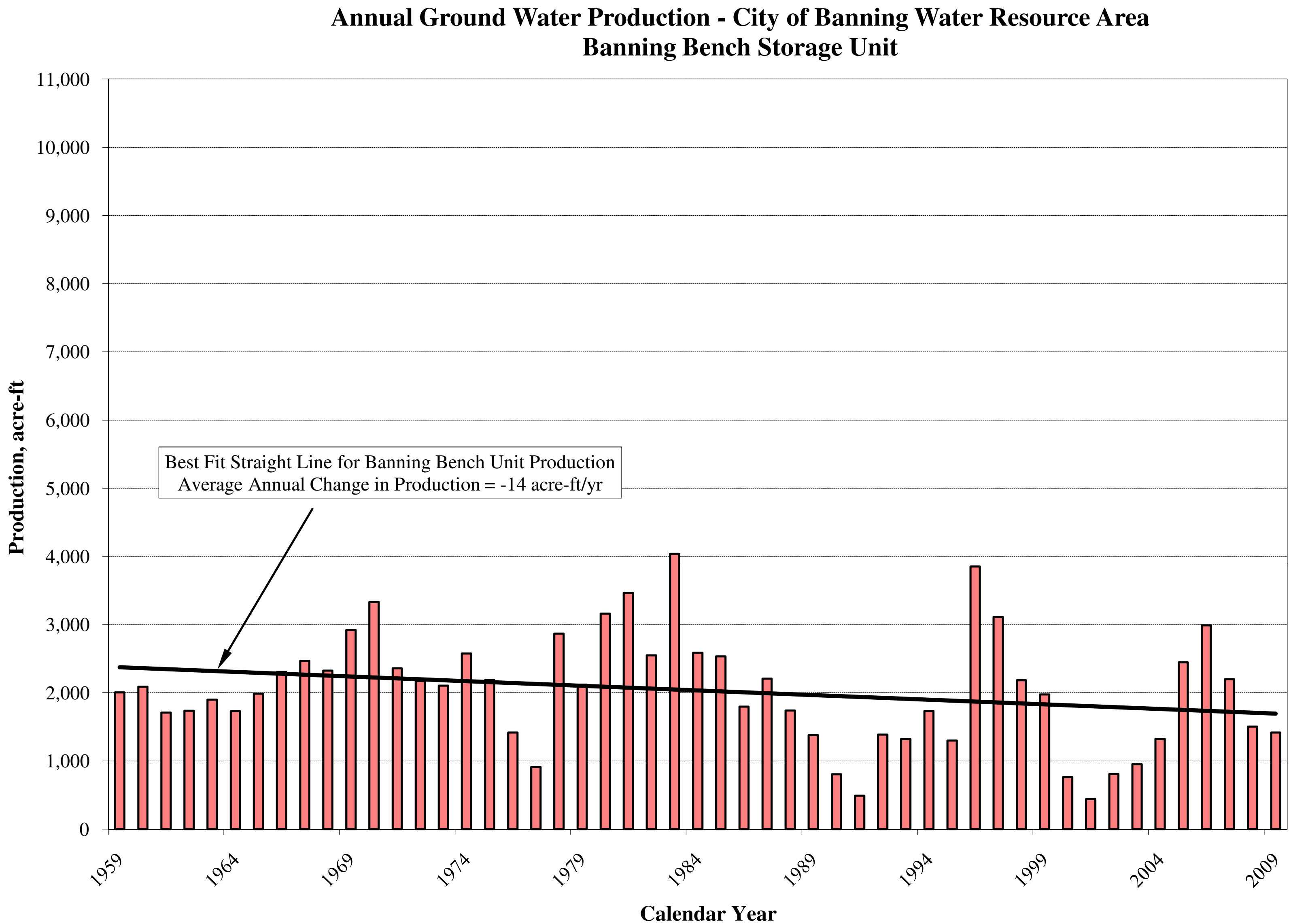

Annual Ground Water Production - City of Banning Water Resource Area
Banning Bench Storage Unit
Production, acre-ft
11,000
10,000
9,000
8,000
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
Best Fit Straight Line for Banning Bench Unit Production
Average Annual Change in Production = -14 acre-ft/yr
1959
1964
1969
1974
1979
1984
1989
1994
1999
2004
2009
Calendar Year

Figure 7c

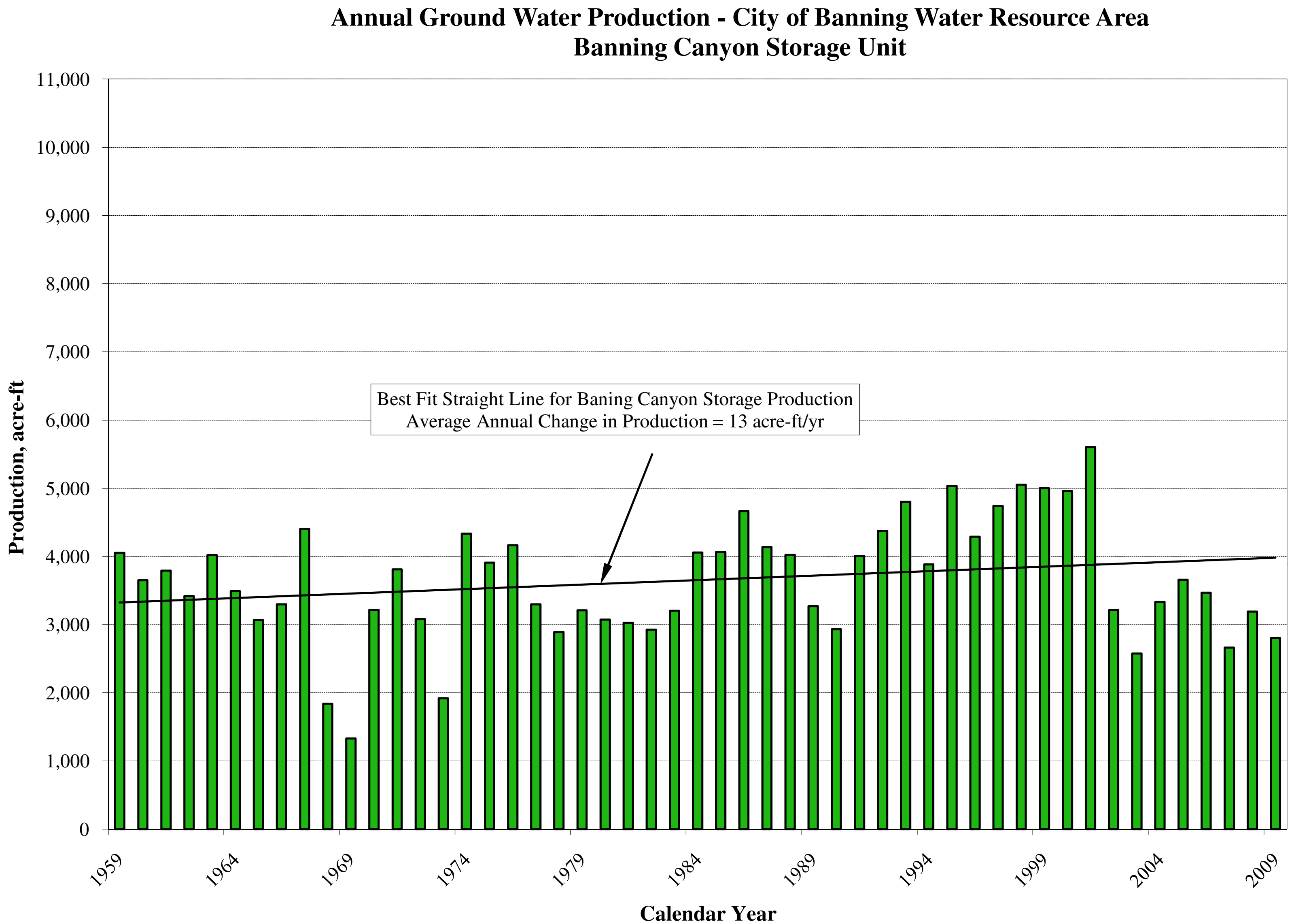

Annual Ground Water Production - City of Banning Water Resource Area
Banning Canyon Storage Unit
11,000
10,000
9,000
8,000
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
Production, acre-ft
Best Fit Straight Line for Baning Canyon Storage Production
Average Annual Change in Production = 13 acre-ft/yr
1959
1964
1969
1974
1979
1984
1989
1994
1999
2004
2009
Calendar Year

Figure 7d

City of Banning
Maximum Perennial Yield Estimates for the Banning and Cabazon Storage Units, and
Available Water Supply From the Beaumont Basin

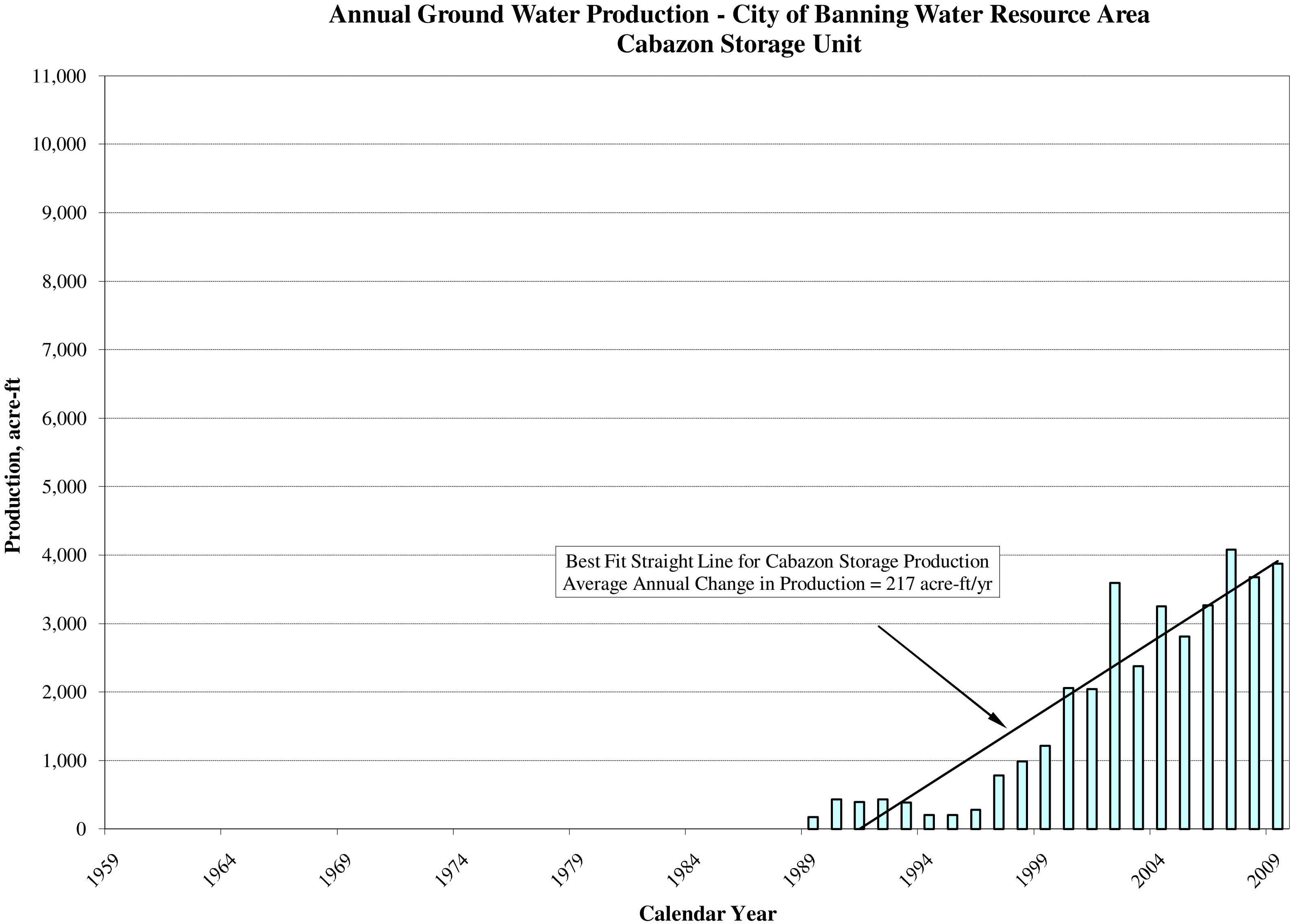
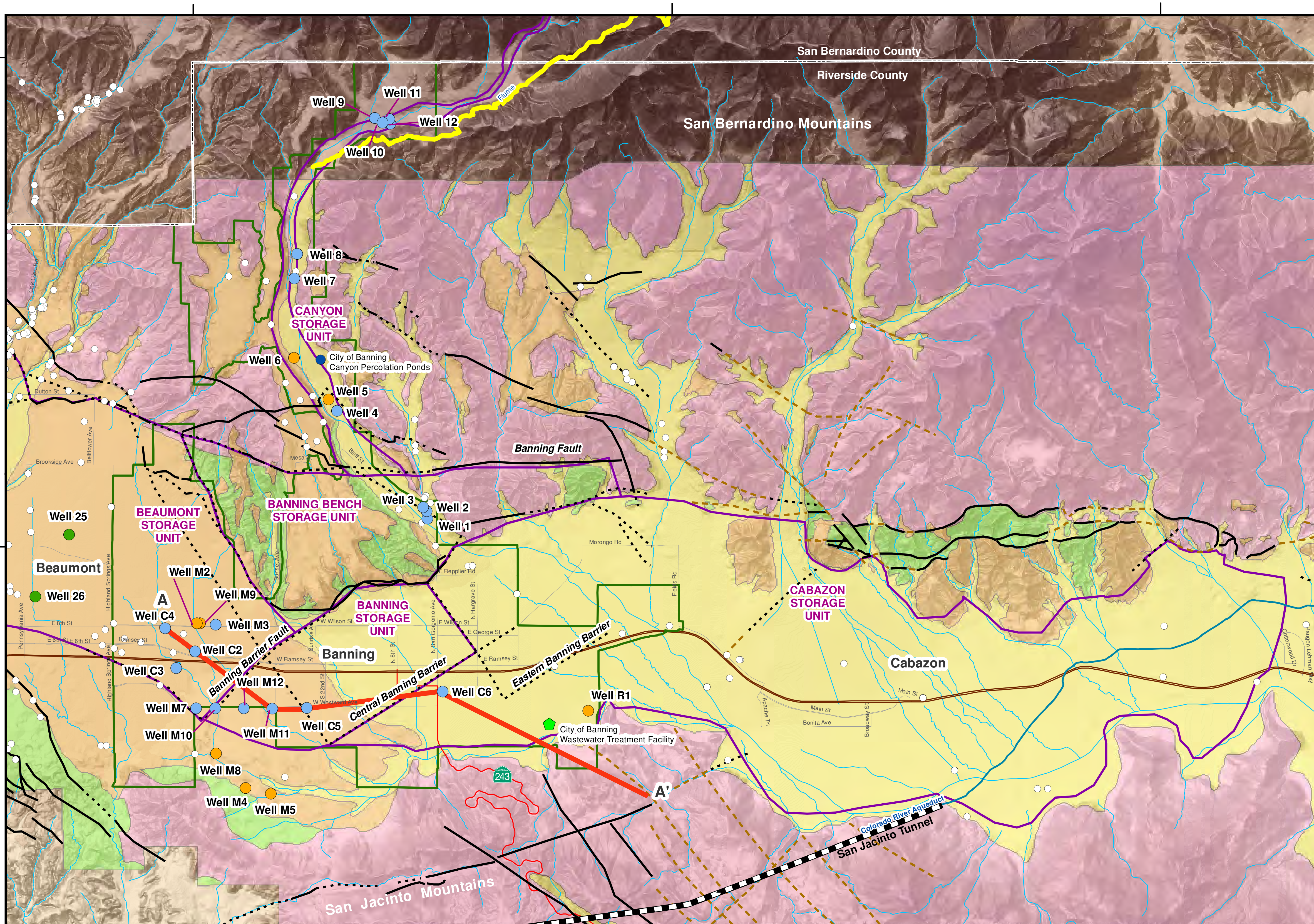


Figure 7e

CITY OF BANNING

MAXIMUM PERENNIAL YIELD ESTIMATES FOR THE BANNING AND CABAZON STORAGE UNITS, AND AVAILABLE WATER SUPPLY FROM THE BEAUMONT BASIN



SURFICIAL GEOLOGY

EXPLANATION

- Active City of Banning Well
- Inactive City of Banning Well
- Active Wells Co-Owned by the City of Banning and Beaumont Cherry Valley Water District
- Other Wells

Geologic Classifications:

- Qya - Quaternary Younger Alluvium
- Qoa - Tertiary to Quaternary Older Alluvium (equivelent to Qvo and Qo of Fig 8b and 8c)
- Qtcv - Tertiary to Quaternary Continental Formation
- pTb - Pre-Tertiary Basement Complex

Source of Geology:
Modified from R.M. Bloyd, Jr. USGS Water Supply Paper 1999-D, Plate 1, 1971.
(Note: Units Qsu and Qsl shown on Figure 8b and 8c are not exposed in study area)

- Cross Section A-A'
- Ground Water Storage Unit Boundary (Source: USGS, 2006)
- City of Banning Boundary
- County Boundary

Fault Classification

- Surface Fault
- Concealed Fault
- Approximate / Inferred Fault
- Colorado River Aqueduct
- San Jacinto Tunnel
- SCE Trans-Basin Diversion from the Upper Whitewater River Watershed

29-Mar-11
Prepared by: DWB
Map Projection: UTM 1927 (Zone 11)

Source of Data:
Faults Modified from R.M. Bloyd, Jr.
USGS Water Supply Paper 1999-D, Plate 1, 1971., and
USGS Scientific Investigation Report 2006-5026, Figure 2, 2006.

NORTH
0 3,500 7,000 Feet

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Figure 8a

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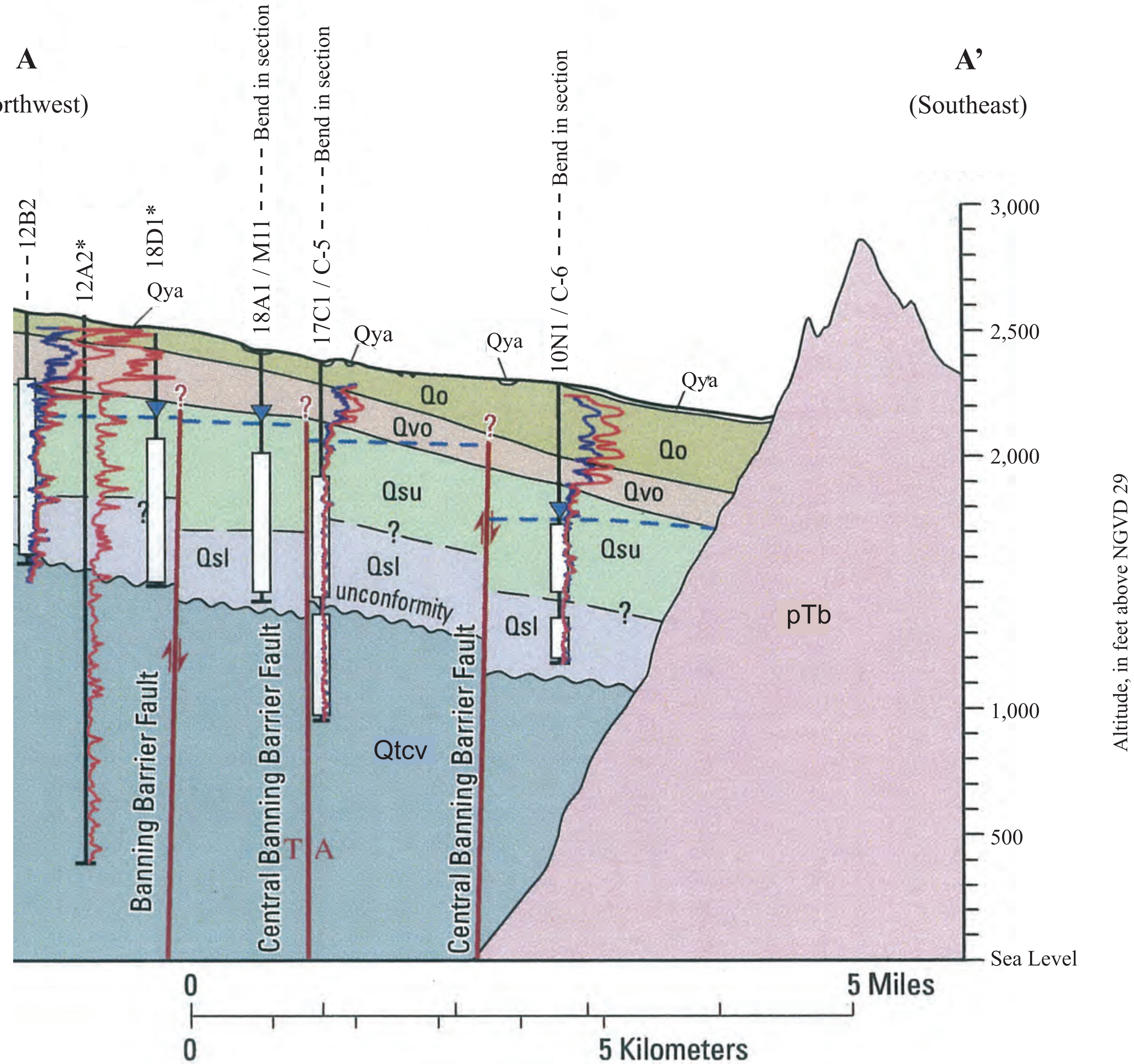

See Figure 8a for Geologic Map
See Figure 8c for Generalized Geologic Cross Section A-A' Legend

Source: Modified from USGS Geology, Ground-water Hydrology, Geochemistry, and Ground-Water Simulation of the Beaumont and Banning Storage Units, San Gorgonio Pass Area, Riverside County, California, Figure 6. Scientific Investigation Report 2006-5026, 2006.

Note: Geologic classification titles have been modified from the 2006 USGS report for purposes of this report. It should be noted that the descriptions are similar in characteristic.

Projects\City_of_Banning\01) Max_Perennial_Yield Estimates\01) Comprehensive_safe_yield_2010_(also look in 02)\02) Figures\Fig_8b_8c_geologic_x-sec\Fig_8b_usgs_x_sec_11-10.ai

Figure 8b	Drawn: Checked: Approved: Date: 29-Mar-11	CITY OF BANNING SCHEMATIC SHOWING GENERALIZED GEOLOGIC CROSS SECTION A-A'

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EXPLANATION

Surficial deposits
(Holocene to Pleistocene)

- Qya **Younger deposits**[1]
- Qo **Older deposits**[1]
- Qvo **Very old deposits**[1]

Younger sedimentary deposits
(Pleistocene)

- Qsu **Sedimentary deposits**[1] **(upper)**
- Qsl **Sedimentary deposits**[2] **(lower)**

Older sedimentary deposits
(Pleistocene to Pliocene)

- Qtcv **Older sedimentary deposits**

Crystalline basement rocks
(Pre-Tertiary)

- pTb **Peninsular Ranges-type**

1 Upper aquifer in Beaumont and Banning storage units

2 Lower aquifer in Beaumont and Banning storage units

Well and identifier—Perforated interval shown as white box. Asterisk (*) indicates well projected to cross section

Water level in well (2000)

Short normal (blue) and long normal (red) resistivity logs

– – – – **Water level**—2000

Fault—Arrows indicate direction of vertical displacement. Letters indicate direction of movement of strike-slip fault. T—towards the viewer, A—away from the viewer

See Figure 8b for Generalized Geologic Cross Section A-A' and Figure 8a for cross section location.

Source: USGS Geology, Ground-water Hydrology, Geochemistry, and Ground-Water Simulation of the Beaumont and Banning Storage Units, San Gorgonio Pass Area, Riverside County, California, Figure 6. Scientific Investigation Report 2006-5026. 2006

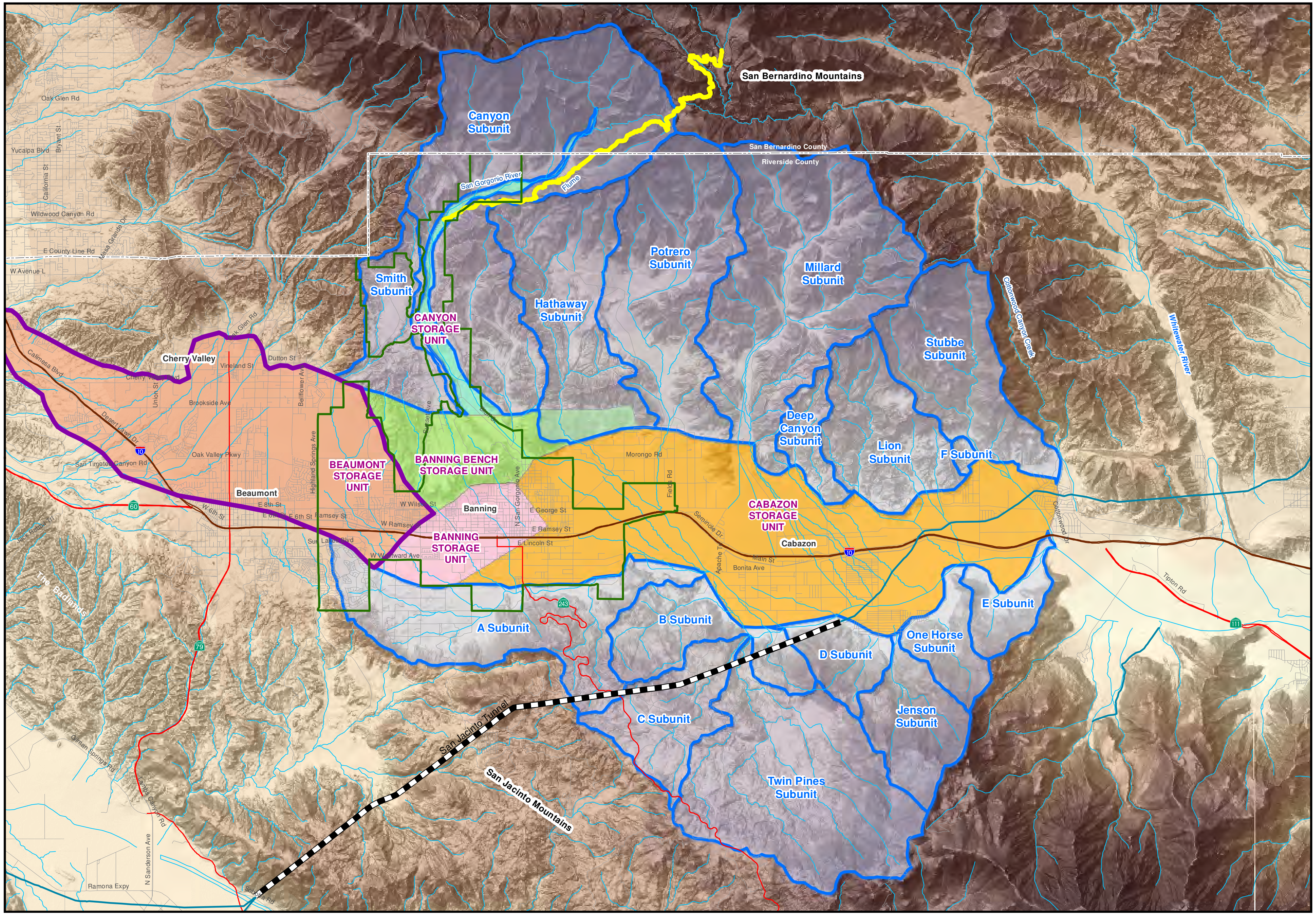
Note: Geologic classification titles have been modified from the 2006 USGS report for purposes of this report. It should be noted that the descriptions are similar in characteristic.

Projects\City_of_Banning\01) Max_Perennial_Yield Estimates\01) Comprehensive_safe_yield_2010_(also look in 02)\02) Figures\Fig_8b_8c_geologic_x-sec\Fig_8c_x_sec_legend_11-10.ai

Figure 8c	Drawn: Checked: Approved: Date: 29-Mar-11	CITY OF BANNING LEGEND FOR SCHEMATIC SHOWING GENERALIZED GEOLOGIC CROSS SECTION A-A'	GEOSCIENCE GEOSCIENCE Support Services, Incorporated P.O. Box 220, Claremont, CA 91711 Tel: (909) 451-6650 Fax: (909) 451-6638 www.gssiwater.com

CITY OF BANNING

MAXIMUM PERENNIAL YIELD ESTIMATES FOR THE BANNING AND CABAZON STORAGE UNITS, AND AVAILABLE WATER SUPPLY FROM THE BEAUMONT BASIN



CITY OF BANNING HYDROLOGIC SUBUNITS AND GROUND WATER STORAGE UNITS

EXPLANATION

- City of Banning Boundary
- Hydrologic Subunit Boundary and Designation
- Adjudicated Ground Water Boundary (source: Beaumont Basin Watermaster, 2009)
- Colorado River Aqueduct
- San Jacinto Tunnel

Ground Water Storage Unit Boundary (Source: USGS, 2006)

- Banning Bench
- Banning
- Beaumont
- Cabazon
- Canyon
- SCE Trans-Basin Diversion from the Upper Whitewater River Watershed

NORTH

0 5,500 11,000 Feet

29-Mar-11

Prepared by: DWB

Map Projection: UTM 1927 (Zone 11)

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Figure 9

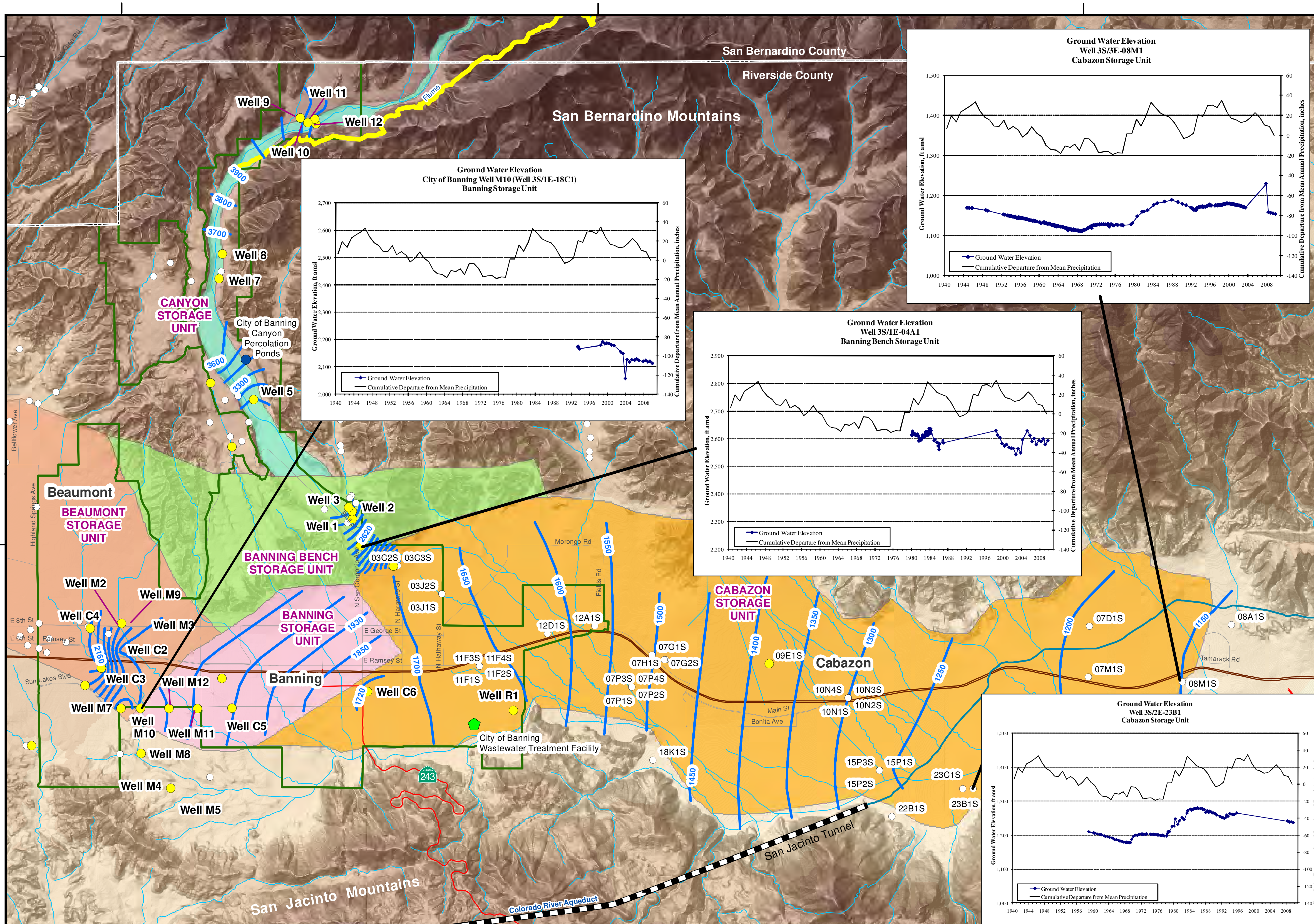
GIS_proj/city_of_banning_per_yield_3-11/0_Fig_9_study_area_w_watersheds_3-11.mxd

CITY OF BANNING

MAXIMUM PERENNIAL YIELD ESTIMATES FOR THE BANNING AND CABAZON STORAGE UNITS, AND AVAILABLE WATER SUPPLY FROM THE BEAUMONT BASIN

GROUND WATER ELEVATIONS WINTER 2009/10

T.1 S.
T.2 S.



T.2 S.
T.3 S.

R.1 W. | R.1 E.
R.1 E. | R.2 E.
R.2 E. | R.3 E.

EXPLANATION

- Winter 2009/10 Ground Water Elevations, ft amsl
- Water Level Well
- City of Banning Boundary
- Colorado River Aqueduct
- San Jacinto Tunnel

Ground Water Storage Unit Boundary (Source: USGS, 2006)

- Banning Bench
- Banning
- Beaumont
- Cabazon
- Canyon
- SCE Trans-Basin Diversion from the Upper Whitewater River Watershed

29-Mar-11

Prepared by: DWB

Map Projection: UTM 1927 (Zone 11)

Source of Data:
Faults Modified from R.M. Boyd, Jr.
USGS Water Supply Paper 1999-D, Plate 1, 1971., and
USGS Scientific Investigation Report 2006-5026, Figure 2, 2006.

NORTH

0 3,500 7,000 Feet

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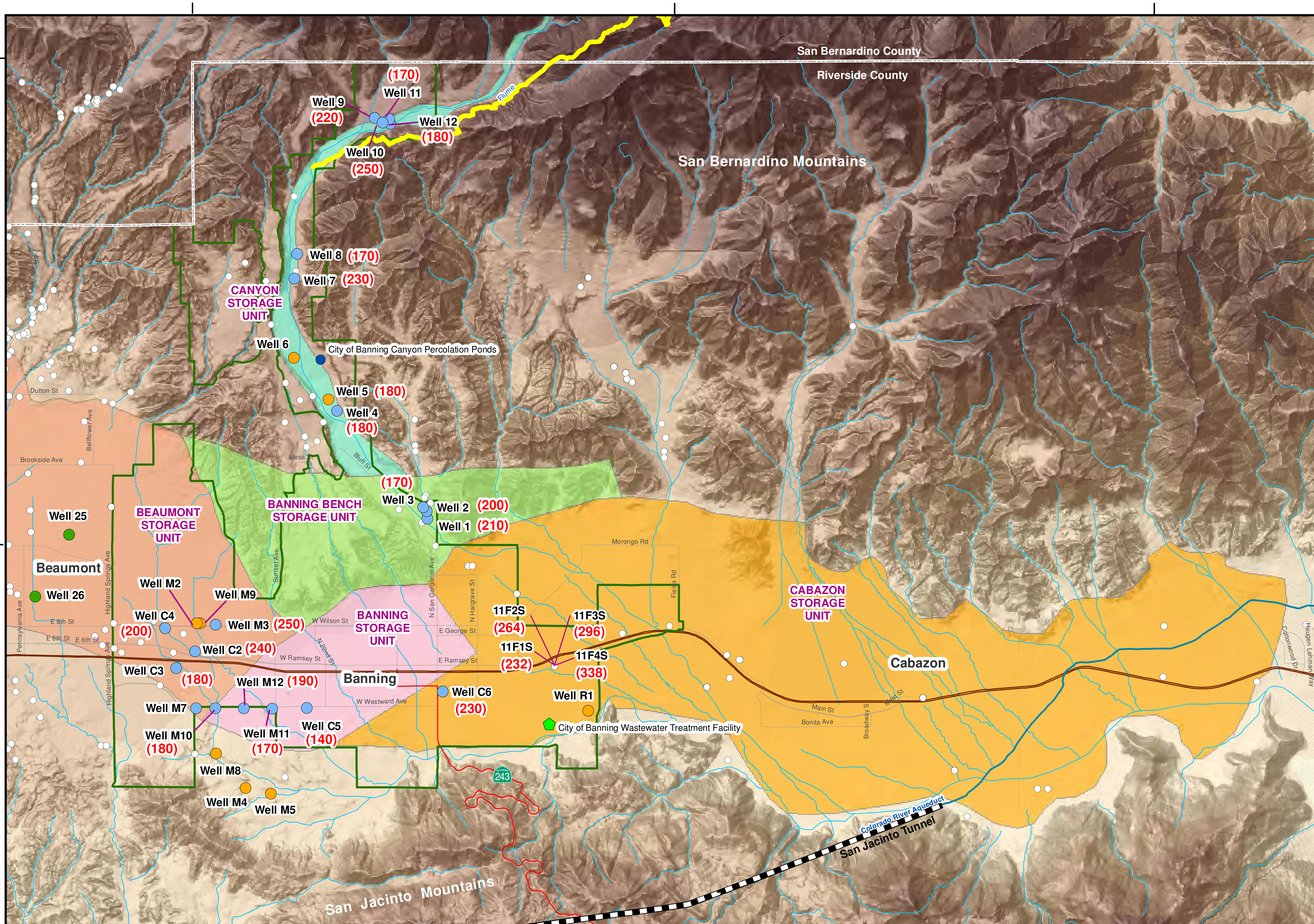
Figure 10

GIS_proj/city_of_banning_per_yield_3-11/0_Fig_10_2010_WL_3-11.mxd

CITY OF BANNING

MAXIMUM PERENNIAL YIELD ESTIMATES FOR THE BANNING AND CABAZON STORAGE UNITS, AND AVAILABLE WATER SUPPLY FROM THE BEAUMONT BASIN



GROUND WATER TOTAL DISSOLVED SOLIDS SPRING 2009

EXPLANATION

- Active City of Banning Well
- Inactive City of Banning Well
- Active Wells Co-Owned by the City of Banning and Beaumont Cherry Valley Water District
- (180) Total Dissolved Solids (Spring 2009) (mg/L)
- Other Wells
- City of Banning Boundary
- Colorado River Aqueduct
- San Jacinto Tunnel

Ground Water Storage Unit Boundary (Source: USGS, 2006)

- Banning Bench
- Banning
- Beaumont
- Cabazon
- Canyon
- SCE Trans-Basin Diversion from the Upper Whitewater River Watershed

Note: Data was unavalible to the Eastern portion of the Cabazon Storage Unit

NORTH

0 3,500 7,000 Feet

29-Mar-11

Prepared by: DWB

Map Projection: UTM 1927 (Zone 11)

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Figure 11

GIS_proj/city_of_banning_per_yield_3-11/0_Fig_11_gw_quality_3-11.mxd

Estimate of Maximum Perennial Yield in the Banning Storage Unit
Wells C-5, M-10, M-11 and M-12
Zero-Net Draft Analysis

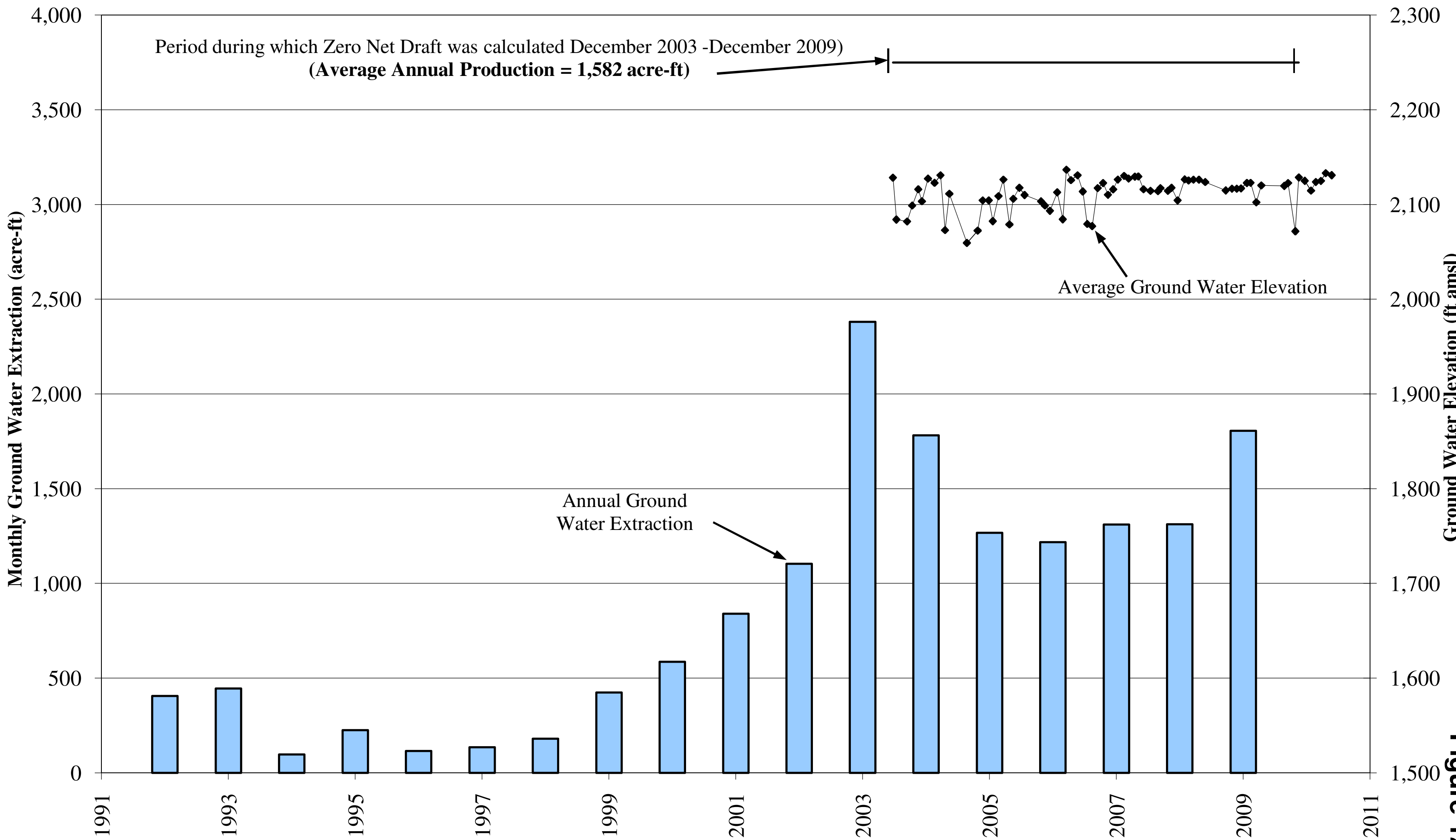

Figure 12

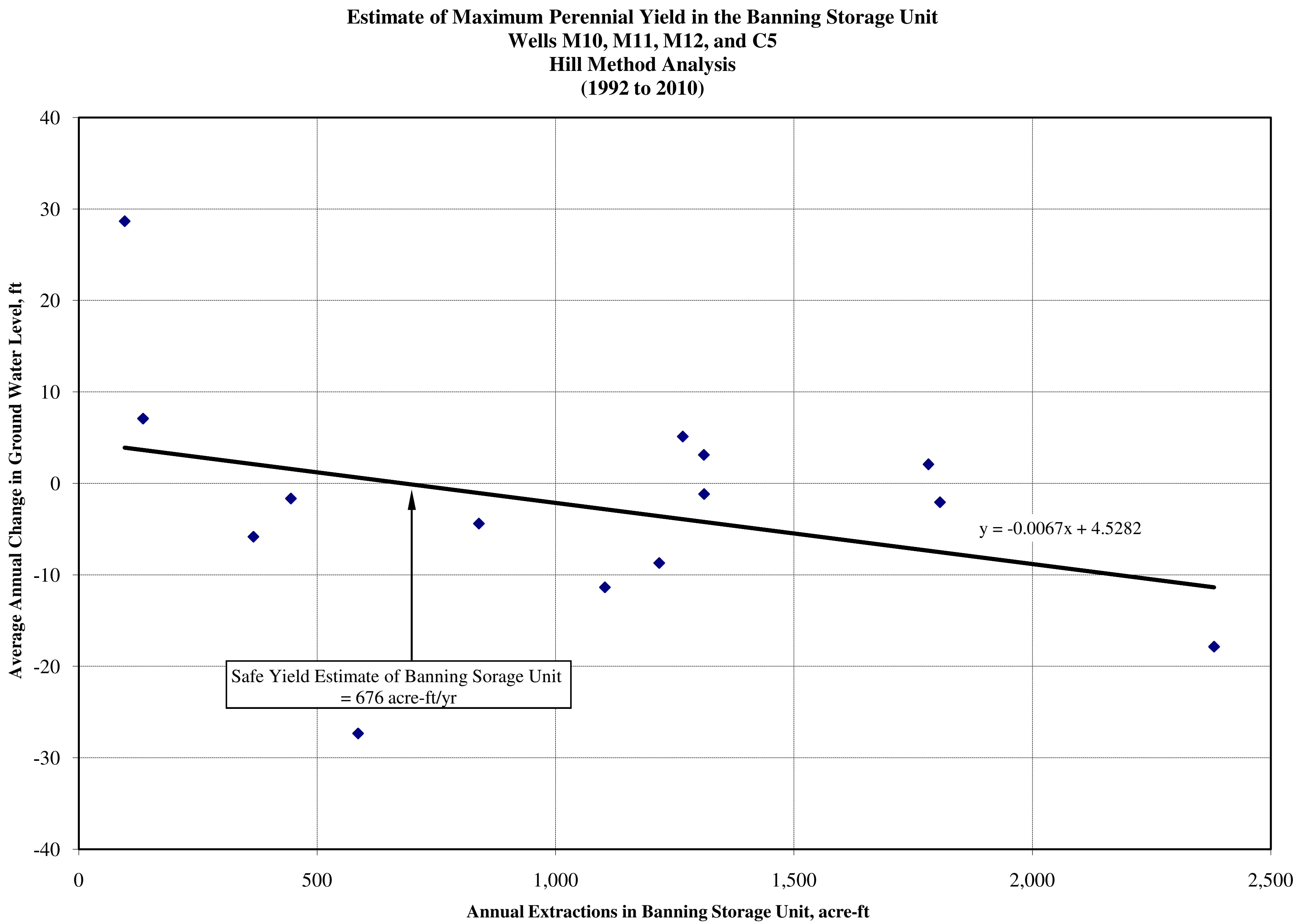
Estimate of Maximum Perennial Yield in the Banning Storage Unit
Wells M10, M11, M12, and C5
Hill Method Analysis
(1992 to 2010)
40
30
20
10
0
-10
-20
-30
-40
Average Annual Change in Ground Water Level, ft
0
500
1,000
1,500
2,000
2,500
Annual Extractions in Banning Storage Unit, acre-ft
y = -0.0067x + 4.5282
Safe Yield Estimate of Banning Sorage Unit
= 676 acre-ft/yr

Figure 13

Estimate of Maximum Perennial Yield in the Banning Bench Storage Unit
Wells 1, 2, and 3
Zero-Net Draft Analysis

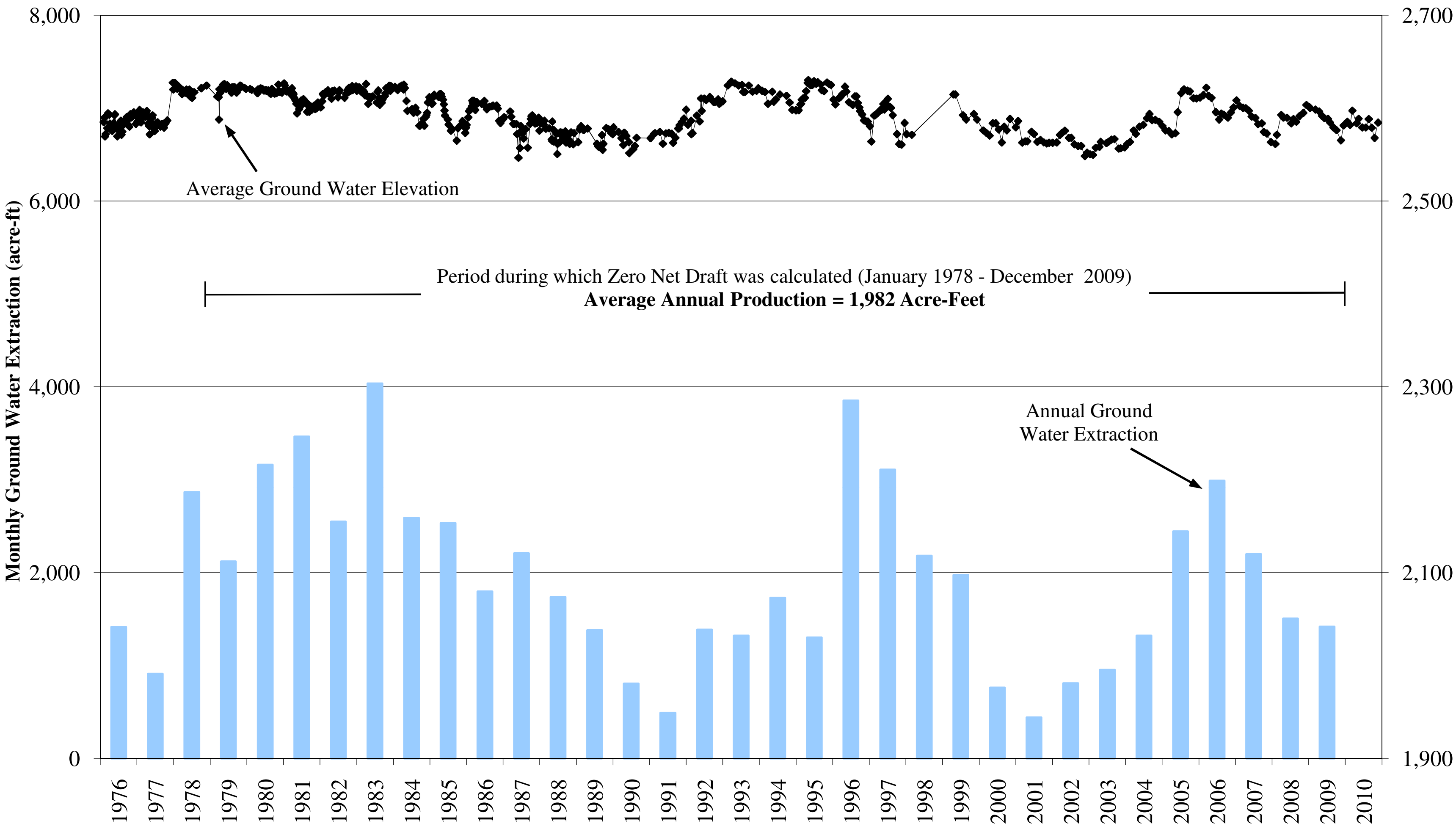

Figure 14

City of Banning
Maximum Perennial Yield Estimates for the Banning and Cabazon Storage Units, and
Available Water Supply From the Beaumont Basin

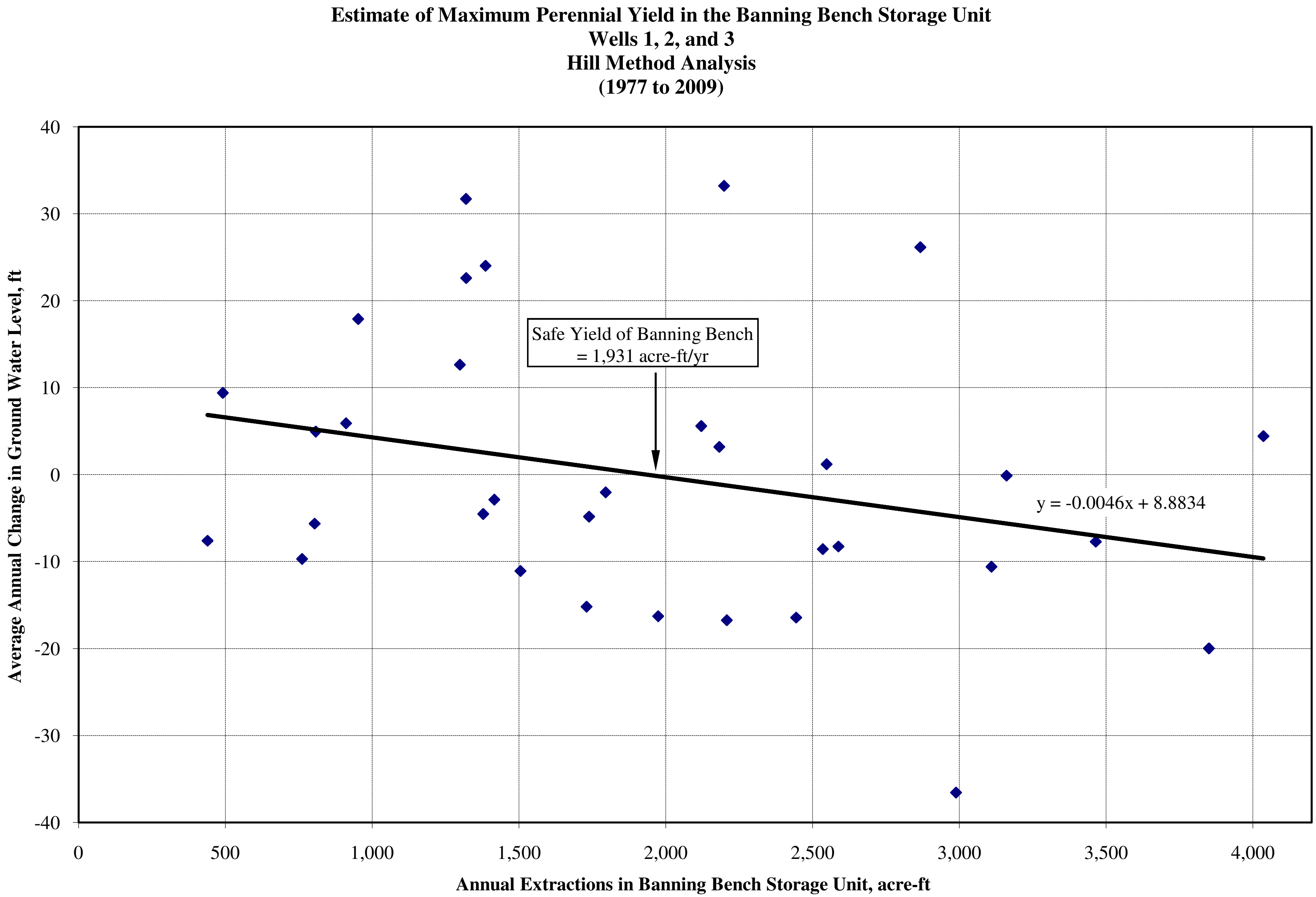

Figure 15

City of Banning
Maximum Perennial Yield Estimates for the Banning and Cabazon Storage Units, and
Available Water Supply From the Beaumont Basin

Estimate of Maximum Perennial Yield in the Banning Canyon Storage Unit
Wells 4 through 12
Zero-Net Draft Analysis

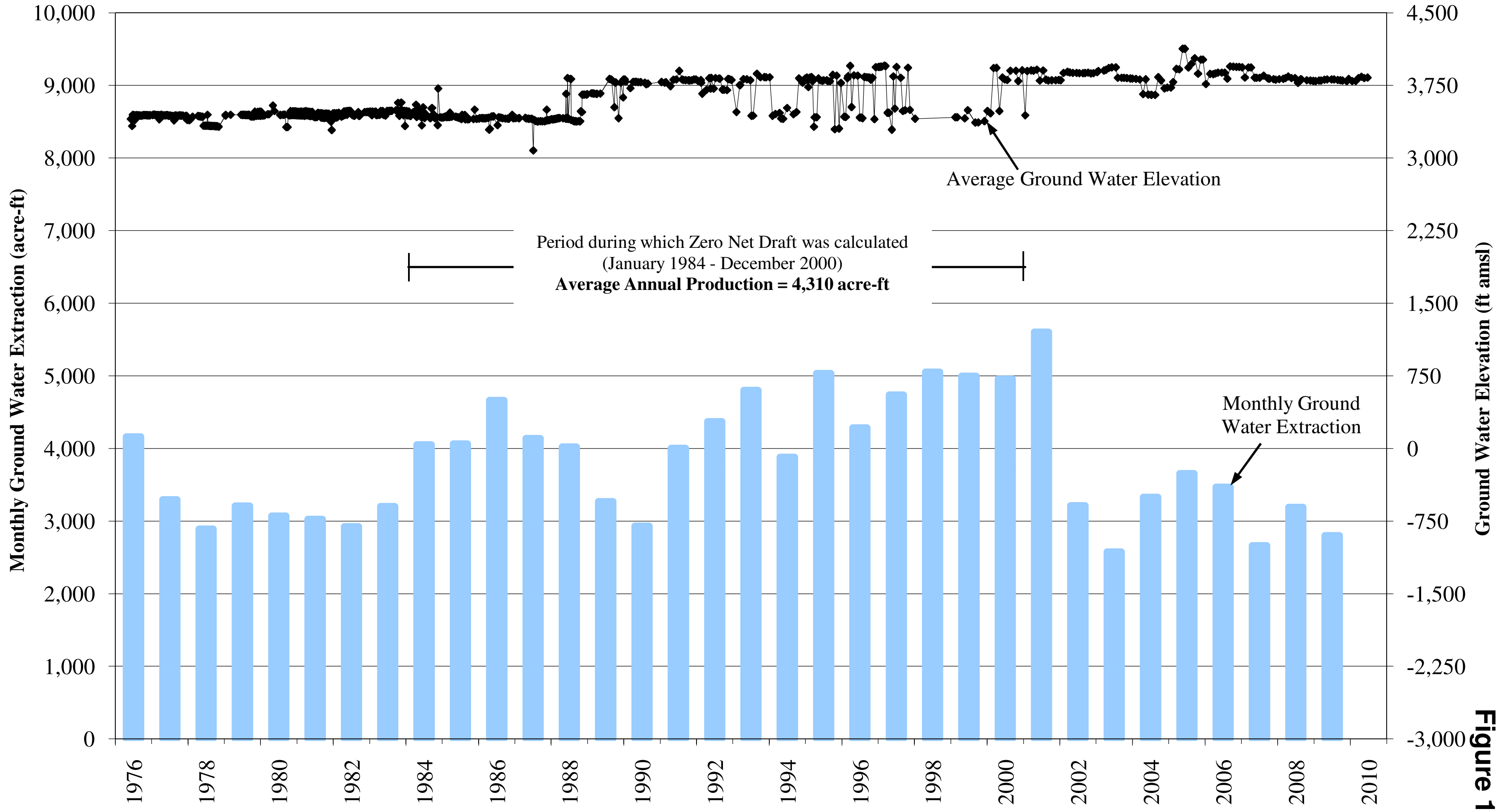

Figure 16

Estimate of Maximum Perennial Yield in the Banning Canyon Storage Unit
Wells 4-12
Hill Method Analysis
(1977 to 2009)

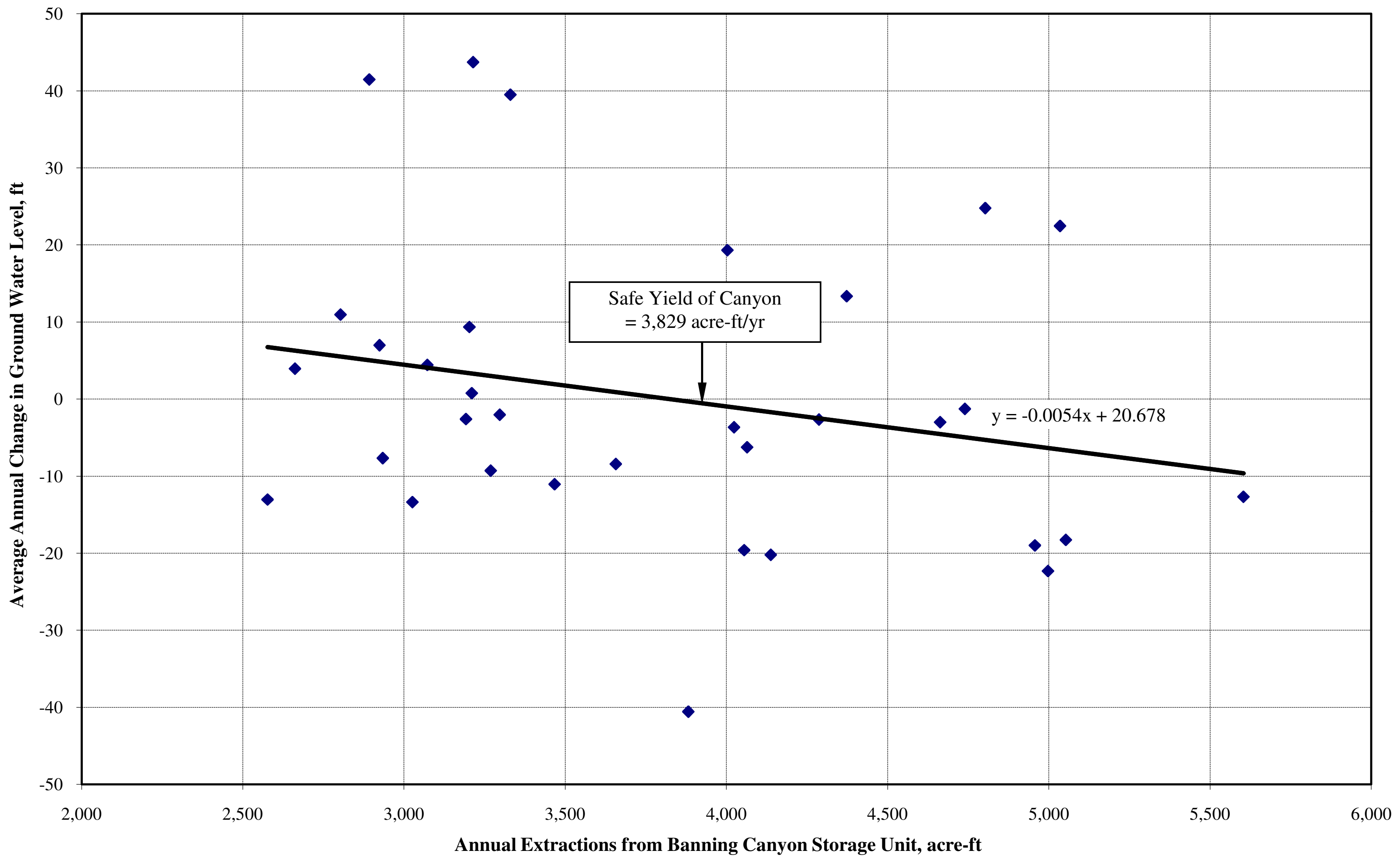

Figure 17

TABLES

Monthly Precipiation and Evaporation Summaries
Beaumont 1E Station

	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec
Maximum Average Monthly Temperature (F)	60.5	63.6	66.2	72.4	78.7	88.1	95.6	95.5	90.4	80.6	69.3	62
Minimum Average Monthly Temperature (F)	38.6	39.1	40	42.7	47.6	52.6	58.4	58.9	55.8	49.3	43	39.2
Average Monthly Precipitation (in)	3.76	3.44	3.12	1.36	0.63	0.15	0.23	0.21	0.51	0.59	1.65	2.09
Average Maximum Monthly Precipitation (in)	20.37	13.2	11.44	6.53	4.14	1.98	3.06	2.49	4.6	4.6	9.02	10.88
Average Minimum Monthly Precipitation (in)	0	0	0	0	0	0	0	0	0	0	0	0
Average Monthly Evaporation (in)	2.97	3.56	4.79	5.06	7.6	9.14	10.97	10.47	8.85	6.46	5.16	3.56

Temperature and precipitation averaged during 1948 to 2001.
Evaporation averaged from 1948 to 1957

Table 1

Source: EarthInfo Inc. (2009)

City of Banning
Maximum Perennial Yield Estimates for the Banning and Cabazon Storage Units, and Available Water Supply From the Beaumont Basin

Table 2

City of Banning Water Resource Area Historical Production 1959-2009

	[1]	[2]		[3]		[4]		[5]
Year	Banning	Banning Bench		Banning Canyon Subunit		Cabazon		Total Production
		City of Banning	Private Producers	City of Banning	Other Producers	City of Banning	Other Producers	
	[acre-ft]							
1959	*	2,005	*	4,053	*	0	*	**6,058**
1960	*	2,089	*	3,651	*	0	*	**5,740**
1961	*	1,707	*	3,790	*	0	*	**5,497**
1962	*	1,736	*	3,420	*	0	*	**5,156**
1963	*	1,899	*	4,017	*	0	*	**5,916**
1964	*	1,731	*	3,491	*	0	*	**5,222**
1965	*	1,988	*	3,066	*	0	*	**5,054**
1966	*	2,304	*	3,297	*	0	*	**5,601**
1967	*	2,468	*	4,401	*	0	*	**6,869**
1968	*	2,326	*	1,839	*	0	*	**4,165**
1969	*	2,920	*	1,327	*	0	*	**4,247**
1970	*	3,333	*	3,219	*	0	*	**6,552**
1971	*	2,359	*	3,808	*	0	*	**6,167**
1972	*	2,171	*	3,080	*	0	*	**5,251**
1973	*	2,104	*	1,919	*	0	*	**4,023**
1974	*	2,576	*	4,333	*	0	*	**6,909**
1975	*	2,188	*	3,907	*	0	*	**6,095**
1976	*	1,415	*	4,162	*	0	*	**5,577**
1977	*	911	*	3,297	*	0	*	**4,208**
1978	*	2,867	*	2,892	*	0	*	**5,759**
1979	*	2,121	*	3,210	*	0	*	**5,331**
1980	*	3,161	*	3,072	*	0	*	**6,233**
1981	*	3,465	*	3,026	*	0	*	**6,491**
1982	*	2,548	*	2,924	*	0	*	**5,472**
1983	*	4,036	*	3,203	*	0	*	**7,239**
1984	*	2,588	*	4,055	*	0	*	**6,643**
1985	*	2,535	*	4,064	*	0	*	**6,599**
1986	*	1,689	76	4,663	0	0	*	**6,428**
1987	*	2,179	90	4,138	0	0	*	**6,407**
1988	*	1,635	90	4,024	0	0	*	**5,749**
1989	*	1,057	90	3,269	0	0	176	**4,592**
1990	*	561	90	2,934	305	0	434	**4,324**
1991	*	408	90	4,003	204	0	398	**5,103**
1992	406	1,266	90	4,373	230	0	434	**6,799**
1993	445	1,246	75	4,803	30	0	388	**6,987**
1994	96	1,657	75	3,925	31	0	208	**5,992**
1995	225	1,289	75	5,007	27	0	205	**6,827**
1996	115	3,785	65	4,245	42	0	278	**8,530**
1997	135	3,065	45	4,713	27	0	785	**8,769**
1998	180	2,117	65	4,925	128	0	986	**8,401**
1999	424	1,910	65	4,756	242	0	1,212	**8,608**
2000	586	696	65	4,837	120	0	2,055	**8,359**
2001	839	364	75	5,451	153	0	2,040	**8,922**

City of Banning

Maximum Perennial Yield Estimates for the Banning and Cabazon Storage Units, and Available Water Supply From the Beaumont Basin

Table 2

Year	Banning [1]	Banning Bench [2]		Banning Canyon Subunit [3]		Cabazon [4]		Total Production [5]
		City of Banning	Private Producers	City of Banning	Other Producers	City of Banning	Other Producers	
	[acre-ft]							
2002	1,103	733	75	2,940	275	0	3,592	**8,718**
2003	2,381	877	75	2,370	207	0	2,374	**8,284**
2004	1,782	1,245	75	3,291	39	323	2,932	**9,686**
2005	1,267	2,369	75	3,577	80	219	2,593	**10,180**
2006	1,217	2,924	65	3,445	22	612	2,655	**10,941**
2007	1,311	2,124	75	2,640	22	1,202	2,957	**10,331**
2008	1,311	1,430	75	3,161	31	914	2,844	**9,766**
2009	1,806	1,341	75	2,767	36	982	2,889	**9,896**

Sources of Data: City of Banning (2010), SGPWA Conditions of the Basin Report (various years) and Riverside County Regional Detention Center EIR, LSA Associates Inc., 2009 report.

Note:

* Values unknown

[1] Banning includes M10, M11, M12 and C-5.

[2] Banning Bench data includes City of Banning Wells 1 through 3 and private producers.

[3] Banning Canyon Storage Unit includes City of Banning Wells 4 through 12, Banning Heights Mutual Water Company and private producers.

[4] Cabazon includes extraction from City of Banning Well C6, Cabazon Water District, Mission Springs Water District as well as private producers within the Cabazon Storage Unit.

[5] Total annual production for the Banning water resource area.

City of Banning
Maximum Perennial Yield Estimates for the Banning and Cabazon Storage Units, and
Available Water Supply From the Beaumont Basin

Cabazon Storage Unit Historical Annual Production 1989 - 2009

Year	Mission Springs Water District[1]	Arrowhead[2]	Cabazon Water Dictrict[3]	Desert Hills Outlets[4]	Robertson's Ready Mix[5]	Morongo Tribe[6]	City of Banning (Well C-6)[7]	Jenson's Water Company[8]	Other[8]	Total
1989	No Data	No Data	No Data	No Data	No Data	No Data		114	62	176
1990	No Data	No Data	No Data	No Data	320	No Data		114		434
1991	No Data	No Data	No Data	No Data	56	No Data		114	228	398
1992	No Data	No Data	No Data	No Data	53	No Data		114	267	434
1993	No Data	No Data	No Data	No Data	56	No Data		114	218	388
1994	No Data	No Data	No Data	No Data	59	No Data		114	35	208
1995	No Data	No Data	No Data	No Data	56	No Data		114	35	205
1996	No Data	No Data	12	No Data	117	No Data		114	35	278
1997	No Data	No Data	441	No Data	195	No Data		114	35	785
1998	No Data	No Data	728	No Data	109	No Data		114	35	986
1999	No Data	No Data	949	No Data	114	No Data		114	35	1,212
2000	159	0	1,200	130	117	300		114	35	2,055
2001	139	256	1,042	136	4	314		114	35	2,040
2002	165	1,366	1,434	146	4	328		114	35	3,592
2003	169	675	882	153	4	342		114	35	2,374
2004	157	823	1,092	169	186	356	323	114	35	3,254
2005	171	595	915	154	139	470	219	114	35	2,812
2006	190	707	824	142	158	485	612	114	35	3,267
2007	206	842	780	143	337	500	1,202	114	35	4,159
2008	164	752	737	138	373	531	914	114	35	3,758
2009	169	752	919	146	192	563	982	114	35	3,871
Average Production [ac-ft/yr]	169	752	854	146	132	419	709	114	67	1,747

[1] Table 2 - San Gorgonio Pass Water Agency Report on Water Conditions (report period 2008) Data for 2009 is the average for previous years.

[2] Table 2 -San Gorgonio Pass Water Agency Report on Water Conditions (report period 2008) Arrowhead values for 2008-2009 are an average of 2001-2007 usage. The location of pumpage is assumed to be in the Morongo Indian Reservation in Potrero Canyon.

[3] Table 2 - San Gorgonio Pass Water Agency Report on Water Conditions (report period 2008) The 2009 value for the Cabazon WD is an average of values from 2000-2008.

[4] Table 2 - San Gorgonio Pass Water Agency Report on Water Conditions (report period 2008). Desert Hills Outlets usage for 2008-2009 were defined as an average from the 2000-2007 interval. 2000 Values obtained from Riverside County Regional Detention Center EIR, LSA Associates Inc., 2009 report.

[5] 1990 to 2008 values are from Table 2 - San Gorgonio Pass Water Agency Report on Water Conditions (various years). The 2009 value reflects an average of 1997-2000 and 2004-2007 values.

[6] Riverside County Regional Detention Center EIR, LSA Associates Inc., 2009 report. Per this report - Morongo tribe does not publish its GW extraction data. The source of water supply information for the 2009 LSA report is: Water Supply Assessment for the Riverside County Regional Detention Center, Krieger & Stewart, November 2009. Therefore, the values 2000-2007 are estimates from the LSA Associates 2009 report. A best fit straight line for data from 2000-2007 was used to determine 2008-2009 values.

[7] C-6 production from City of Banning (well became operational in 2004).

[8] Information for years 1994 to 2009 from Page 22 of Ron Barto and Associates, Hydrogeology of the Cabazon Basin, August 20, 1990. Data for previous years are compiled from various years of the San Gorgonio Pass Water Agency Report on Water Conditions.

Table 3

Watershed Areas Upstream From the Cabazon Storage Unit

Name	Area [acres]	Average Isoheytal Precip [in./yr]	Average Precip [ac-ft/yr]	Average Recharge as 8% of Precip [ac-ft/yr]
Cabazon Storage Unit	17,222	15.17	21771.48	1741.72
Hathaway Subunit	5,805	23.73	11479.39	918.35
Millard Watershed	10,360	24.6	21238.66	1699.09
Potrero Watershed	7,276	24.7	14970.99	1197.68
Deep Canyon Watershed	1,156	17.8	1718.81	137.50
Jenson Watershed	2,667	19.7	4375.54	350.04
Lion Watershed	3,876	18.0	5804.32	464.35
One Horse Watershed	1,574	12.5	1633.12	130.65
Stubbe Watershed	4,801	19.0	7601.88	608.15
Twin Watershed	8,804	25.0	18363.32	1469.07
A Watershed	6,343	17.9	9434.75	754.78
B Watershed	2,919	16.8	4096.11	327.69
C Watershed	2,930	20.7	5045.15	403.61
D Watershed	1,556	15.3	1979.69	158.38
E Watershed	1,366	8.9	1015.11	81.21
F Watershed	170	15.9	226.44	18.12
		Total	**130,755**	**10,460**

Table 4

APPENDICES

GEOSCIENCE

APPENDIX A

Annual Precipitation and Evaporation

GEOSCIENCE

Annual Precipitation and Evaporation

Year	Precipitation Beaumont Station [inches]	Precipitation Banning Bench Station [inches]	Precipitation Cabazon Station [inches]	Evaporation Beaumont 1 E Station [inches]
1888	18.53	-	-	-
1889	22.50	-	-	-
1890	16.29	-	-	-
1891	18.93	-	-	-
1892	13.51	-	-	-
1893	21.67	-	-	-
1894	12.80	-	-	-
1895	19.88	-	-	-
1896	9.48	-	-	-
1897	15.94	-	-	-
1898	7.48	-	-	-
1899	10.54	-	-	-
1900	11.27	-	-	-
1901	13.85	-	-	-
1902	15.40	-	-	-
1903	20.82	-	-	-
1904	12.78	-	-	-
1905	31.79	-	-	-
1906	18.96	-	-	-
1907	22.24	-	-	-
1908	17.18	-	-	-
1909	27.93	-	-	-
1910	9.49	-	-	-
1911	20.41	-	-	-
1912	16.83	-	-	-
1913	14.83	-	-	-
1914	25.33	-	-	-
1915	28.80	-	-	-
1916	27.89	-	-	-
1917	13.81	-	-	-
1918	22.72	-	-	-
1919	14.86	-	-	-
1920	21.66	-	-	-
1921	30.63	-	-	-
1922	23.18	-	-	-
1923	13.74	-	-	-
1924	14.04	-	-	-
1925	13.15	-	-	-
1926	26.92	-	-	-
1927	26.02	-	-	-
1928	12.83	-	-	-
1929	11.19	-	-	-
1930	22.49	-	-	-

Sources of Data: San Gorgonio Pass Water Agency (2003), EarthInfo (2009)

Annual Precipitation and Evaporation

Year	Precipitation Beaumont Station [inches]	Precipitation Banning Bench Station [inches]	Precipitation Cabazon Station [inches]	Evaporation Beaumont 1 E Station [inches]
1931	21.69	-	-	-
1932	20.01	-	-	-
1933	15.59	-	-	-
1934	14.55	-	-	-
1935	15.47	-	-	-
1936	25.25	-	-	-
1937	24.23	-	-	-
1938	26.84	-	-	-
1939	18.65	-	-	-
1940	23.77	-	-	-
1941	29.96	-	-	-
1942	10.94	-	-	-
1943	27.33	-	-	-
1944	19.53	-	-	-
1945	20.20	-	-	-
1946	21.40	-	-	-
1947	7.96	-	-	-
1948	10.91	-	-	-
1949	13.76	-	-	-
1950	11.50	-	-	89.23
1951	16.71	-	-	88.03
1952	23.03	-	-	83.68
1953	7.86	-	-	78.59
1954	20.28	-	-	-
1955	13.30	-	-	70.05
1956	9.89	-	-	66.62
1957	21.14	-	-	-
1958	23.38	-	-	-
1959	10.84	-	-	-
1960	13.65	-	-	-
1961	8.08	-	-	-
1962	13.00	-	-	-
1963	16.47	-	-	-
1964	13.59	-	-	-
1965	24.54	-	-	-
1966	15.88	-	-	-
1967	20.17	-	-	-
1968	10.71	-	-	-
1969	29.13	-	-	-

Sources of Data: San Gorgonio Pass Water Agency (2003), EarthInfo (2009)

Annual Precipitation and Evaporation

Year	Precipitation Beaumont Station [inches]	Precipitation Banning Bench Station [inches]	Precipitation Cabazon Station [inches]	Evaporation Beaumont 1 E Station [inches]
1970	16.82	-	-	-
1971	12.42	-	-	-
1972	7.77	-	-	-
1973	17.97	-	-	-
1974	17.50	21.50	-	-
1975	14.10	18.14	-	-
1976	18.70	29.28	14.19	-
1977	16.69	28.19	11.98	-
1978	36.37	47.56	27.44	-
1979	16.90	23.30	15.1	-
1980	31.61	43.19	24.15	-
1981	10.60	11.80	9.49	-
1982	26.70	36.97	19.26	-
1983	30.80	46.33	24.13	-
1984	12.17	12.21	7.46	-
1985	11.50	16.38	8.73	-
1986	14.80	20.85	11.41	-
1987	15.10	16.44	11.48	-
1988	11.60	16.70	7.77	-
1989	8.80	12.07	4.74	-
1990	9.70	15.27	6.93	-
1991	18.80	17.50	19.4	-
1992	20.70	25.94	14.53	-
1993	34.98	39.92	26.07	-
1994	15.50	17.75	10.09	-
1995	27.90	34.41	20.47	-
1996	17.80	24.38	10.53	-
1997	14.20	20.62	8.02	-
1998	24.32	28.41	17.83	-
1999	6.40	13.33	6.14	-
2000	9.78	16.72	8.53	-
2001	15.80	16.31	8.37	-
2002	14.40	8.80	3.39	-
2003	18.10	18.79	11.83	-
2004	20.68	20.89	13.58	-
2005	22.26	24.77	13.33	-
2006	12.40	15.03	6.9	-
2007	9.40	11.66	5.02	-
2008	15.62	20.55	10.34	-
2009	8.13	11.27	5.98	-
Minimum	**6.40**	**8.80**	**3.39**	**66.62**
Maximum	**36.37**	**47.56**	**27.44**	**89.23**
Average	**17.77**	**22.31**	**12.49**	**79.37**

Sources of Data: San Gorgonio Pass Water Agency (2003), EarthInfo (2009)

APPENDIX B

Well Hydrographs

GEOSCIENCE

APPENDIX B

HYDROGRAPHS

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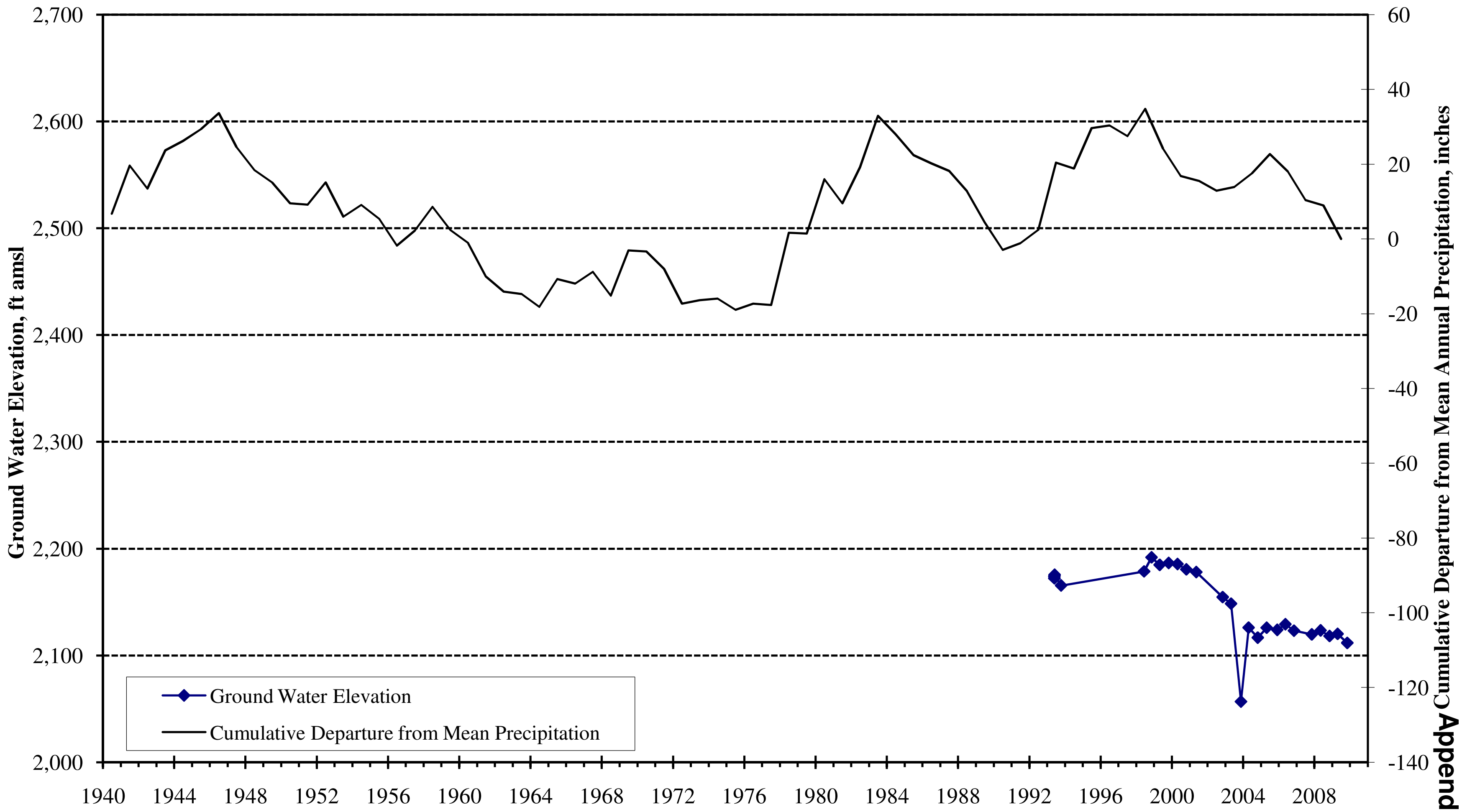
Description **Page**

Ground Water Elevation
City of Banning Well M10 (3S/1E-18C1)
Banning Storage Unit



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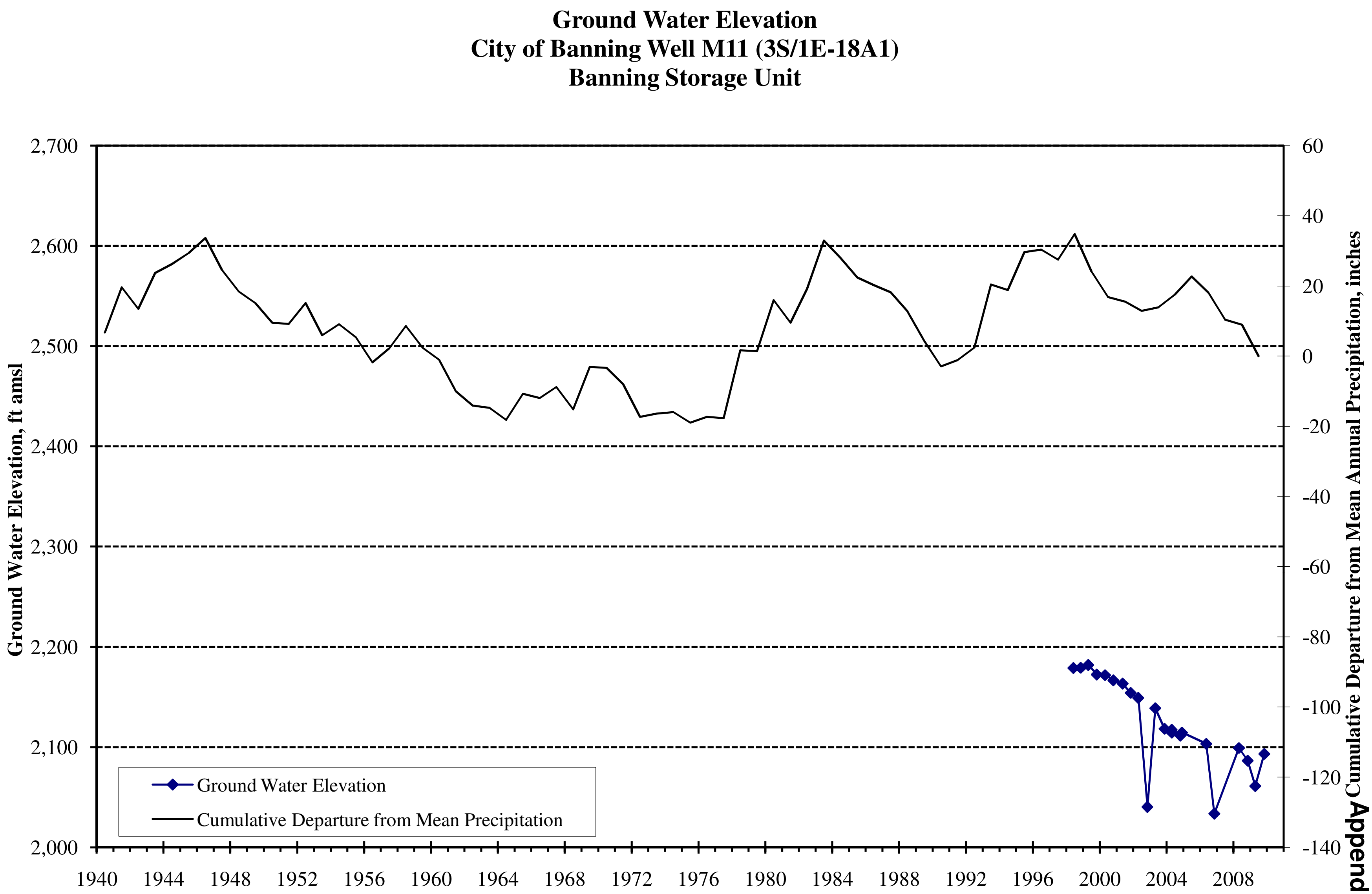
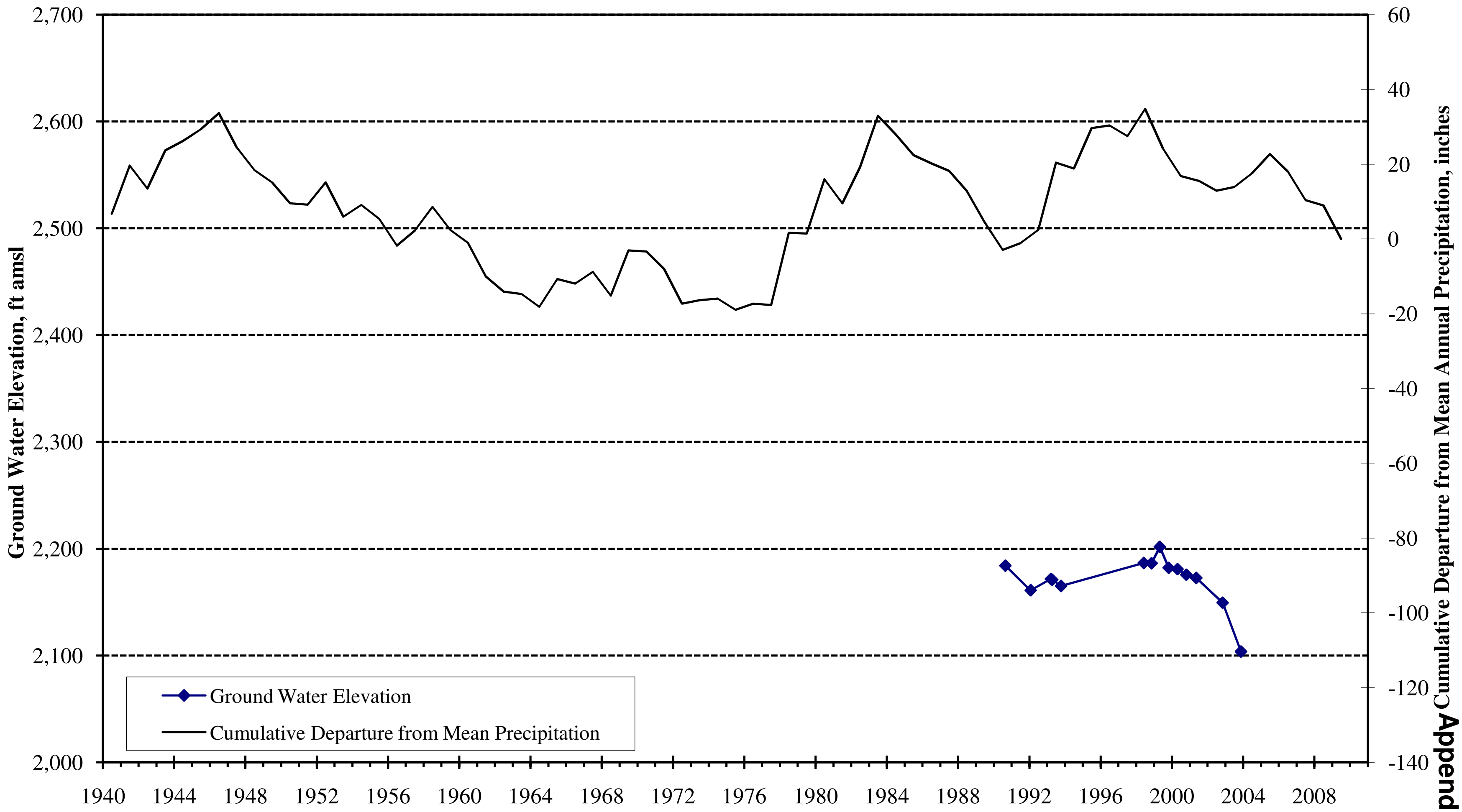

Ground Water Elevation
City of Banning Well M11 (3S/1E-18A1)
Banning Storage Unit
Ground Water Elevation, ft amsl
Cumulative Departure from Mean Annual Precipitation, inches
2,700
2,600
2,500
2,400
2,300
2,200
2,100
2,000
60
40
20
0
-20
-40
-60
-80
-100
-120
-140
1940
1944
1948
1952
1956
1960
1964
1968
1972
1976
1980
1984
1988
1992
1996
2000
2004
2008
Ground Water Elevation
Cumulative Departure from Mean Precipitation

Appendix B

Ground Water Elevation
City of Banning Well M12 (3S/1E-18B1)
Banning Storage Unit



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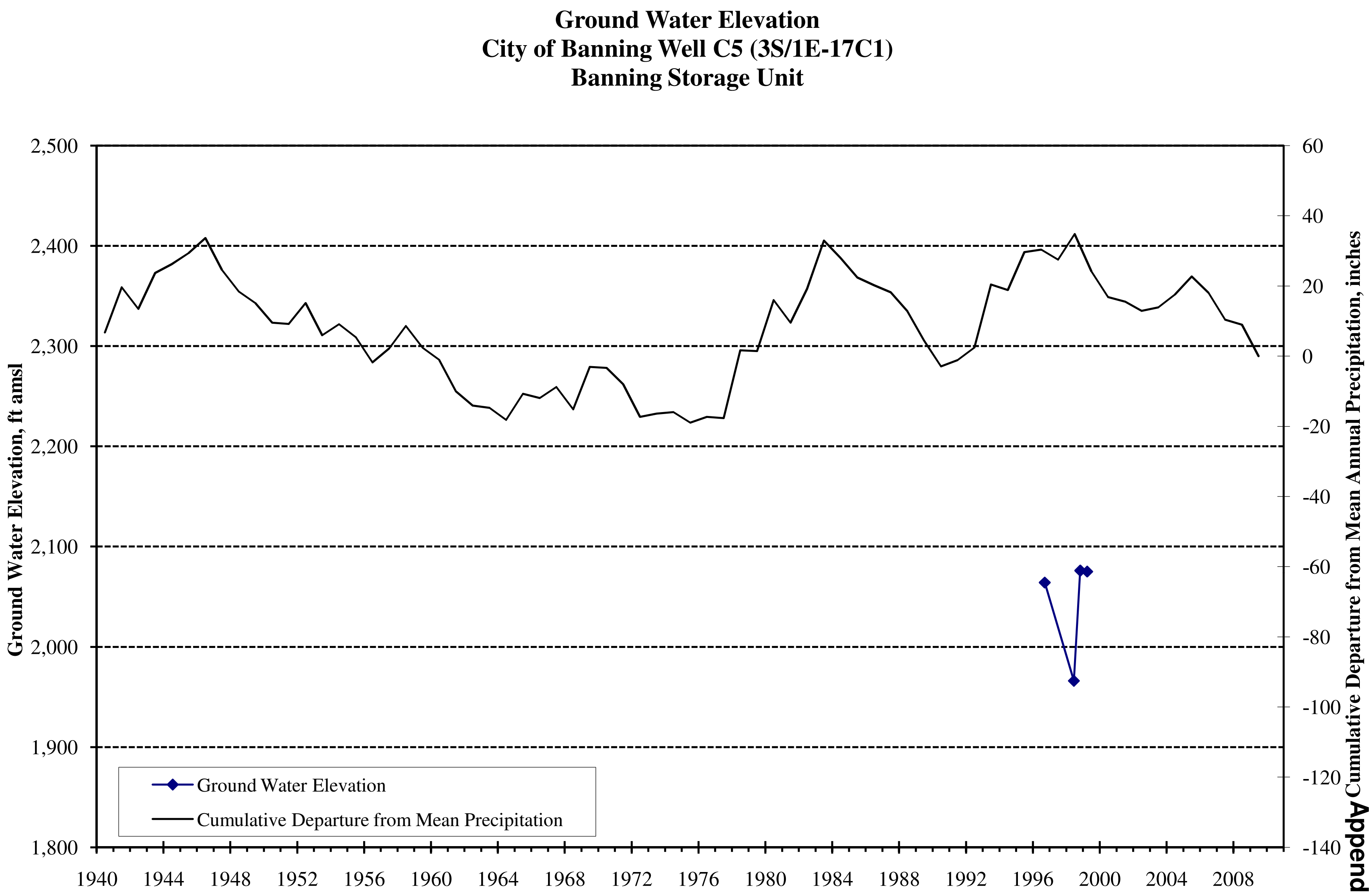
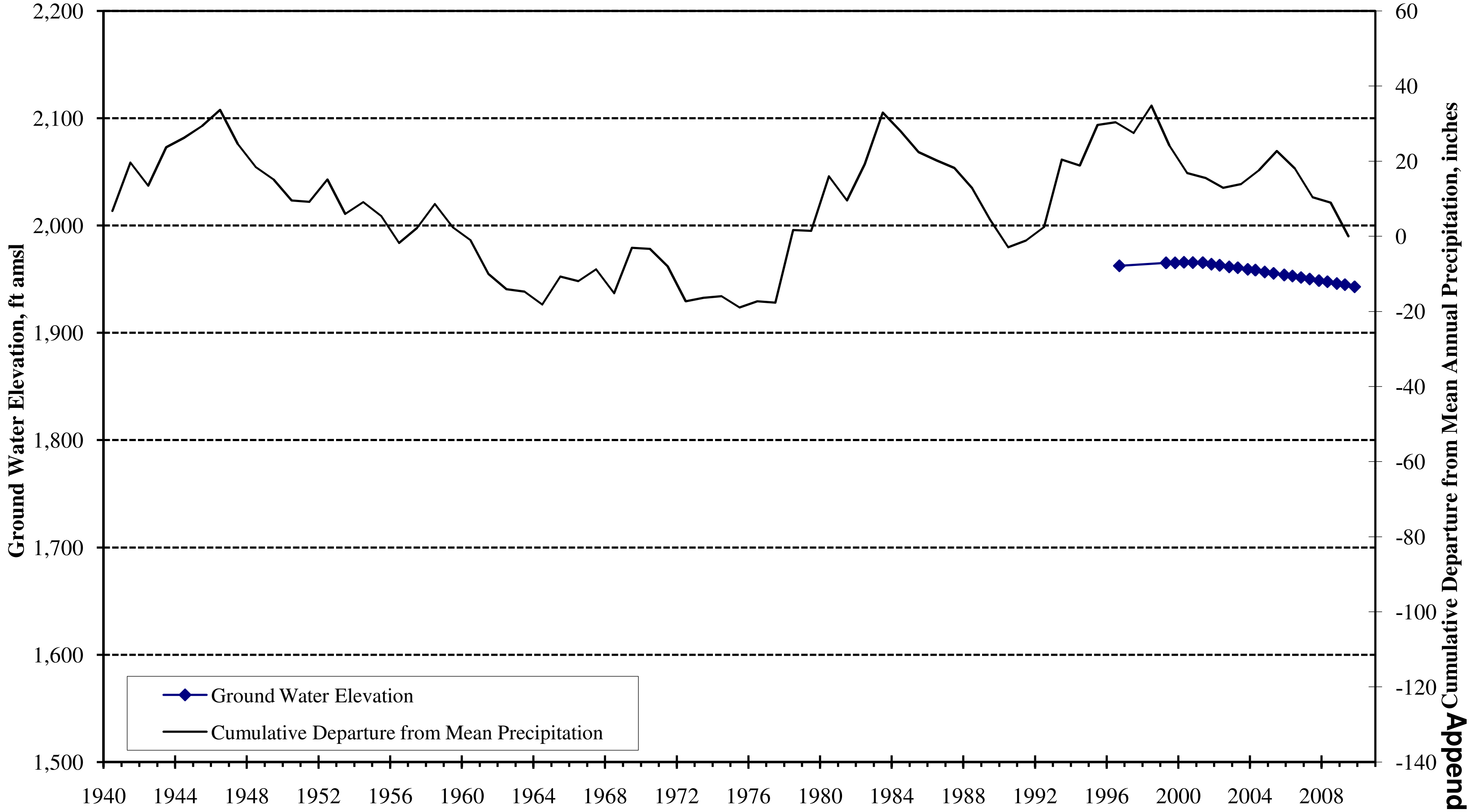

Ground Water Elevation
City of Banning Well C5 (3S/1E-17C1)
Banning Storage Unit
Ground Water Elevation, ft amsl
Cumulative Departure from Mean Annual Precipitation, inches
2,500
2,400
2,300
2,200
2,100
2,000
1,900
1,800
60
40
20
0
-20
-40
-60
-80
-100
-120
-140
1940 1944 1948 1952 1956 1960 1964 1968 1972 1976 1980 1984 1988 1992 1996 2000 2004 2008
Ground Water Elevation
Cumulative Departure from Mean Precipitation

Appendix B

Ground Water Elevation
Well 3S/1E-08M1
Banning Storage Unit



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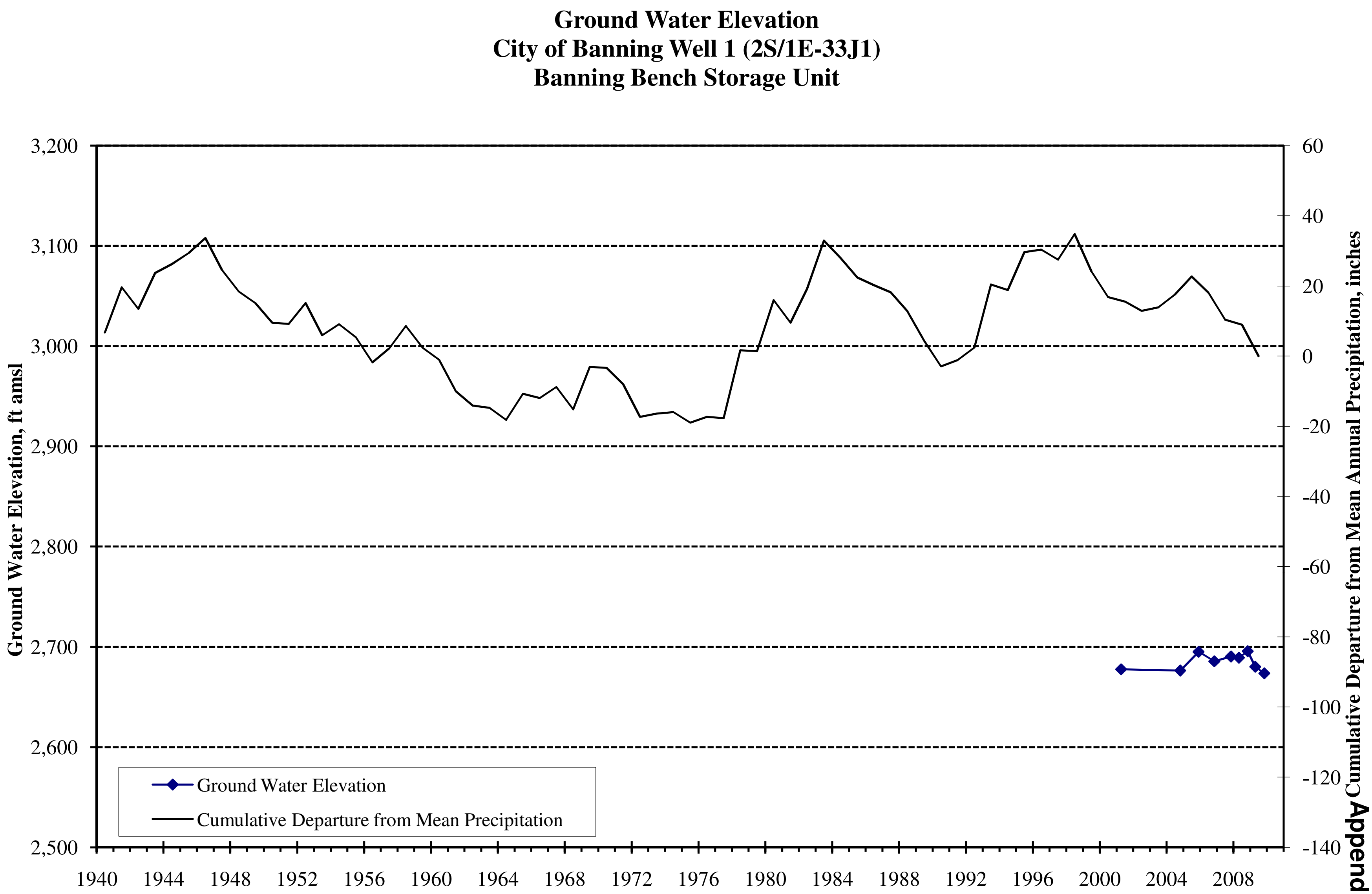
Ground Water Elevation
City of Banning Well 1 (2S/1E-33J1)
Banning Bench Storage Unit
Ground Water Elevation, ft amsl
Cumulative Departure from Mean Annual Precipitation, inches
3,200
3,100
3,000
2,900
2,800
2,700
2,600
2,500
60
40
20
0
-20
-40
-60
-80
-100
-120
-140
1940
1944
1948
1952
1956
1960
1964
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1972
1976
1980
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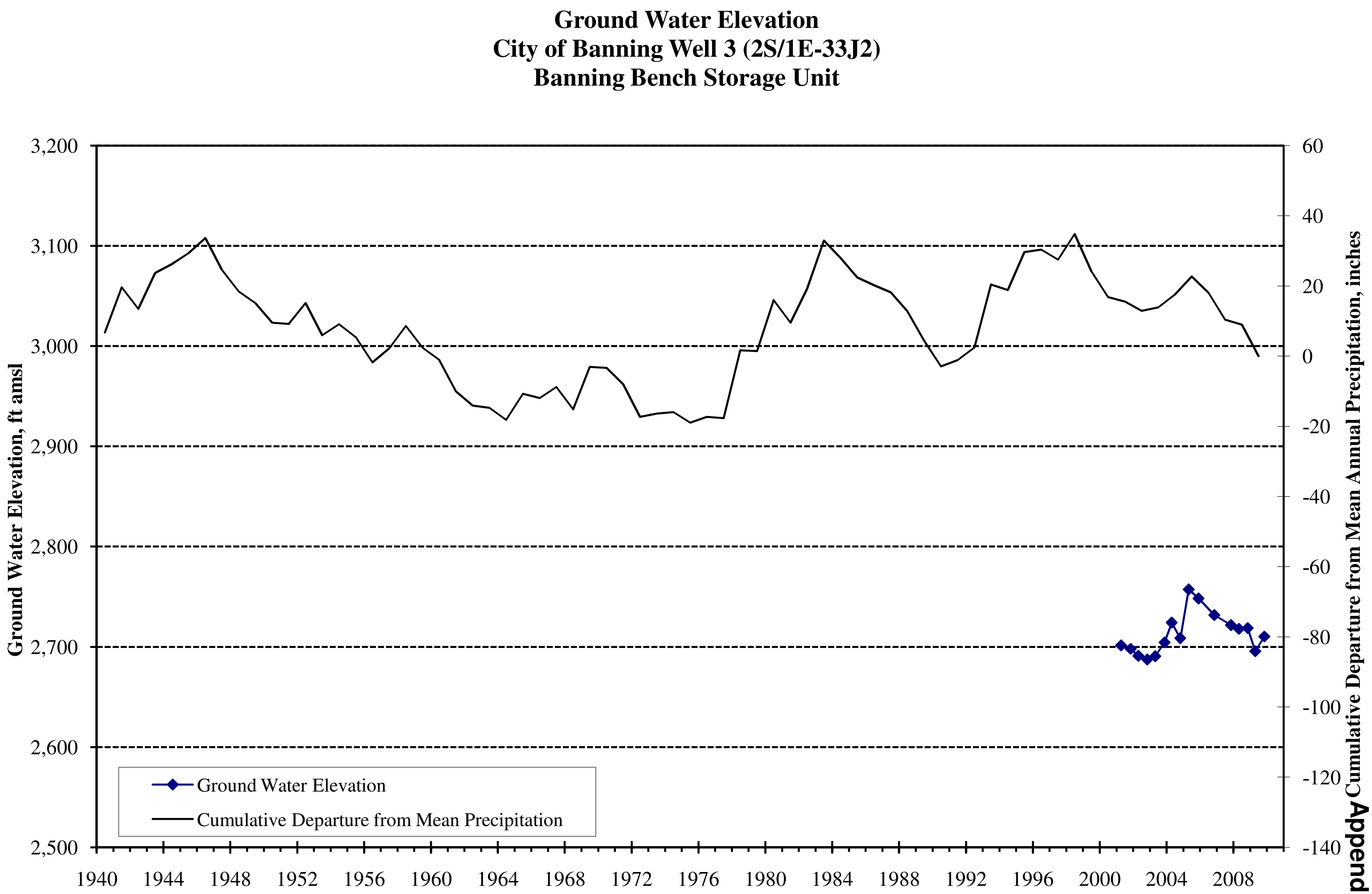
2004
2008
Ground Water Elevation
Cumulative Departure from Mean Precipitation

Appendix B


Ground Water Elevation
City of Banning Well 3 (2S/1E-33J2)
Banning Bench Storage Unit
Ground Water Elevation, ft amsl
Cumulative Departure from Mean Annual Precipitation, inches
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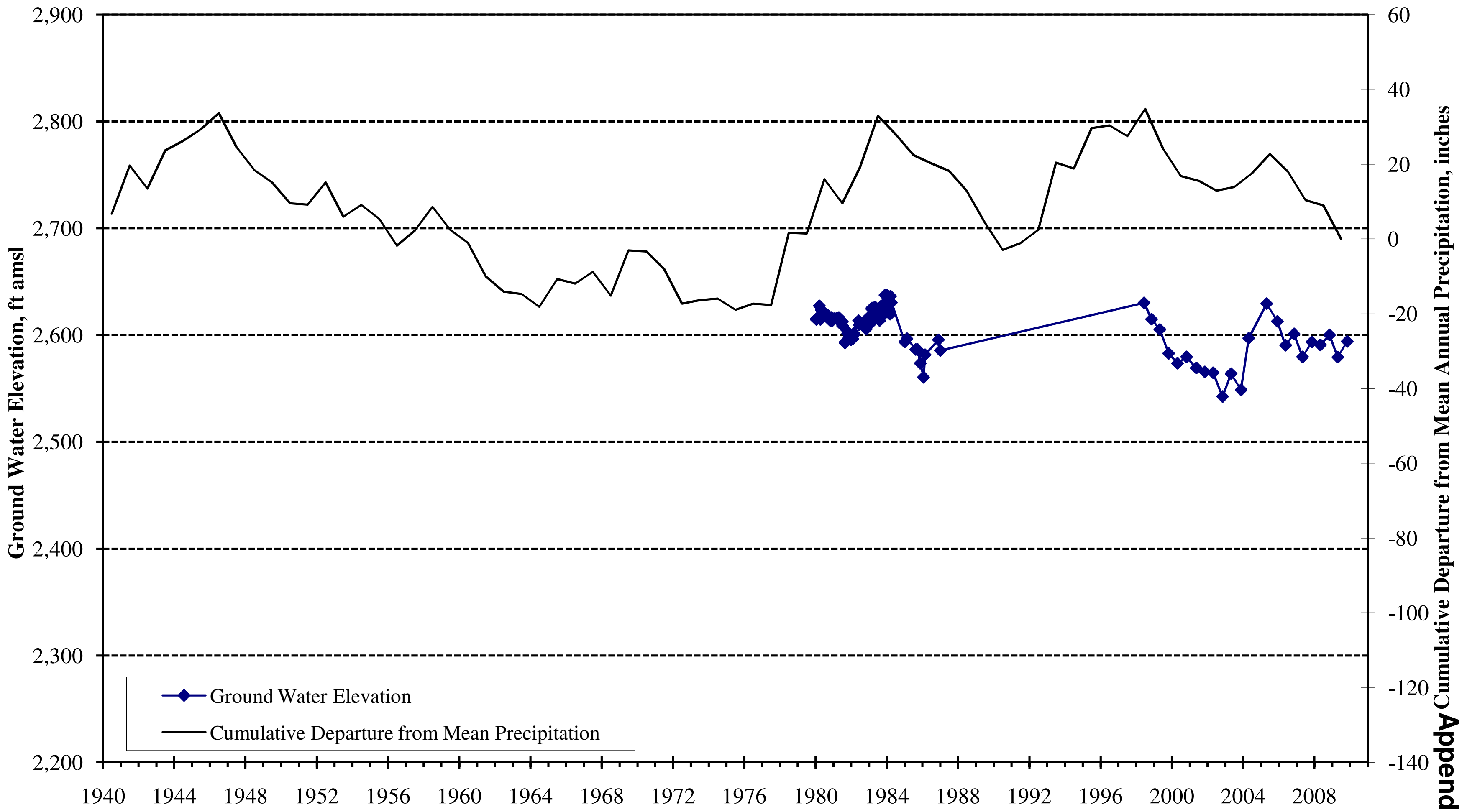
3,100
3,000
2,900
2,800
2,700
2,600
2,500
60
40
20
0
-20
-40
-60
-80
-100
-120
-140
1940
1944
1948
1952
1956
1960
1964
1968
1972
1976
1980
1984
1988
1992
1996
2000
2004
2008
Ground Water Elevation
Cumulative Departure from Mean Precipitation

Appendix B

Ground Water Elevation
Well 3S/1E-04A1
Banning Bench Storage Unit



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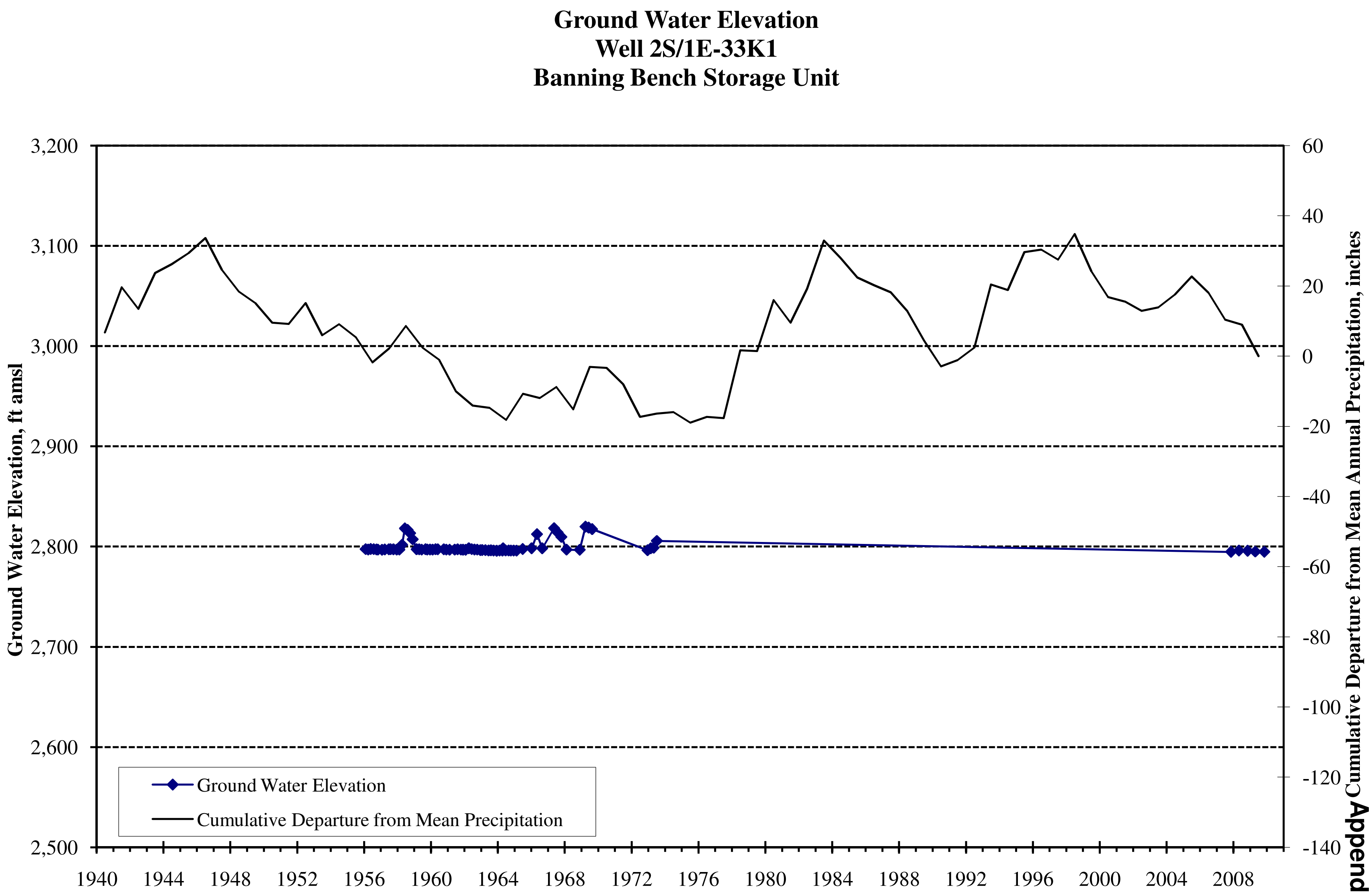
Ground Water Elevation
Well 2S/1E-33K1
Banning Bench Storage Unit
Ground Water Elevation, ft amsl
Cumulative Departure from Mean Annual Precipitation, inches
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3,000
2,900
2,800
2,700
2,600
2,500
60
40
20
0
-20
-40
-60
-80
-100
-120
-140
1940
1944
1948
1952
1956
1960
1964
1968
1972
1976
1980
1984
1988
1992
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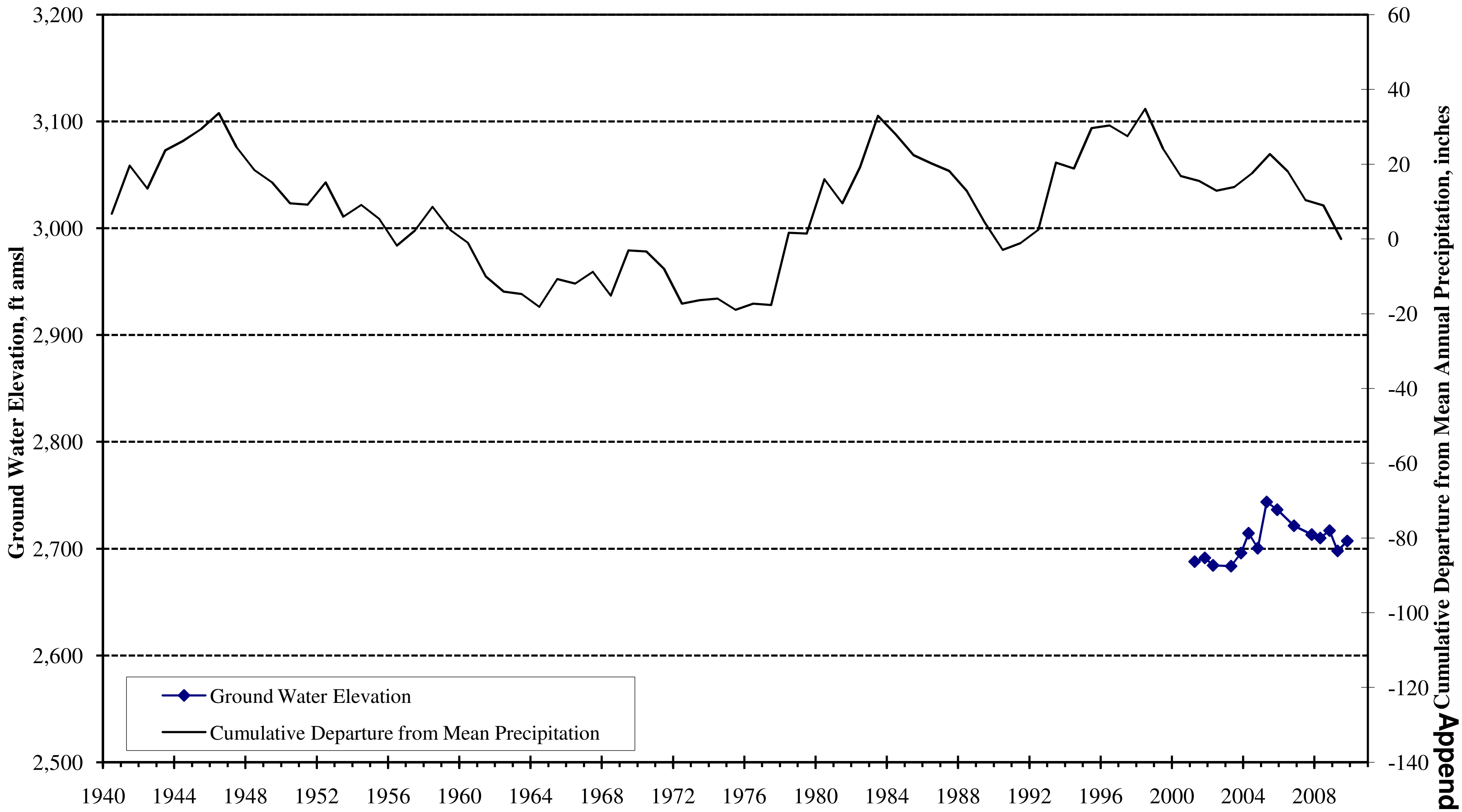
2000
2004
2008
Ground Water Elevation
Cumulative Departure from Mean Precipitation

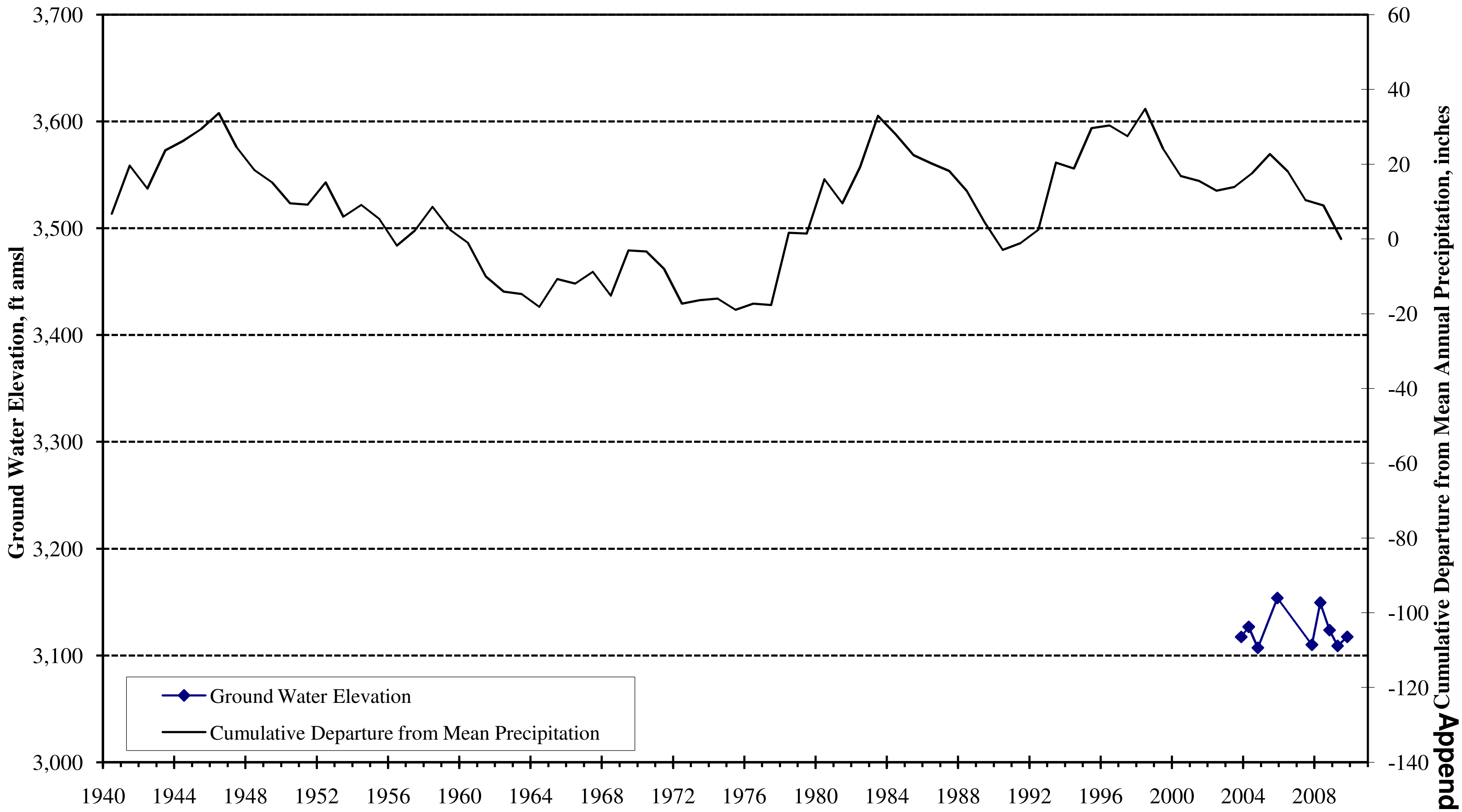
Appendix B

Ground Water Elevation
Well 2S/1E-33J4
Banning Bench Storage Unit



Appendix B

Ground Water Elevation
City of Banning Well 4 (2S/1E-29H1)
Banning Canyon Storage Unit



Appendix B

Ground Water Elevation
City of Banning Well 5 (2S/1E-29B1)
Banning Canyon Storage Unit

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Ground Water Elevation
City of Banning Well 6 (2S/1E-20P1)
Banning Canyon Storage Unit

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Ground Water Elevation
City of Banning Well 7 (2S/1E-17M1)
Banning Canyon Storage Unit

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Ground Water Elevation
City of Banning Well 8 (2S/1E-17F2)
Banning Canyon Storage Unit

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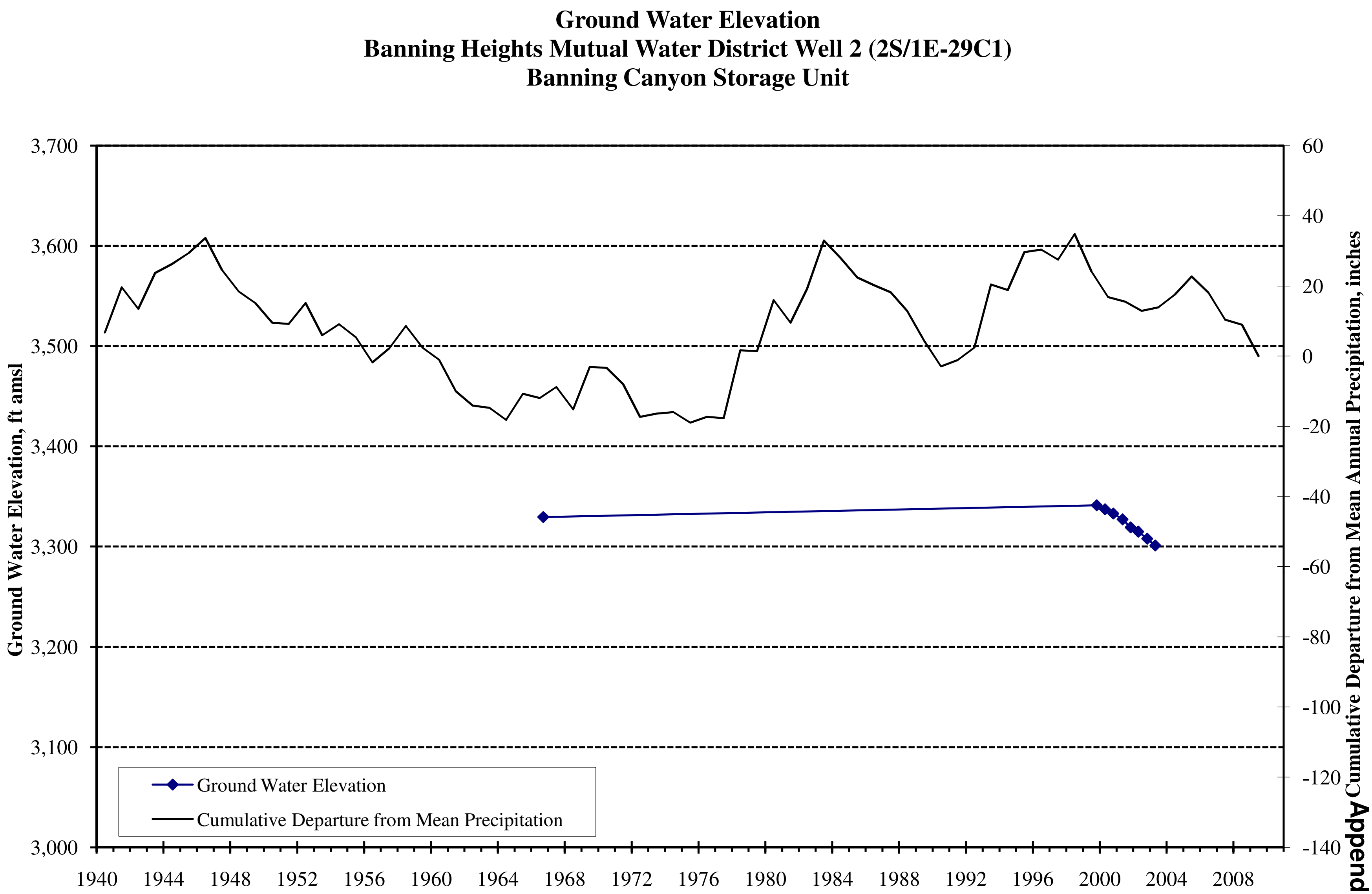
Ground Water Elevation
Banning Heights Mutual Water District Well 2 (2S/1E-29C1)
Banning Canyon Storage Unit
Ground Water Elevation, ft amsl
Cumulative Departure from Mean Annual Precipitation, inches
3,700
3,600
3,500
3,400
3,300
3,200
3,100
3,000
60
40
20
0
-20
-40
-60
-80
-100
-120
-140
1940
1944
1948
1952
1956
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2004
2008
Ground Water Elevation
Cumulative Departure from Mean Precipitation

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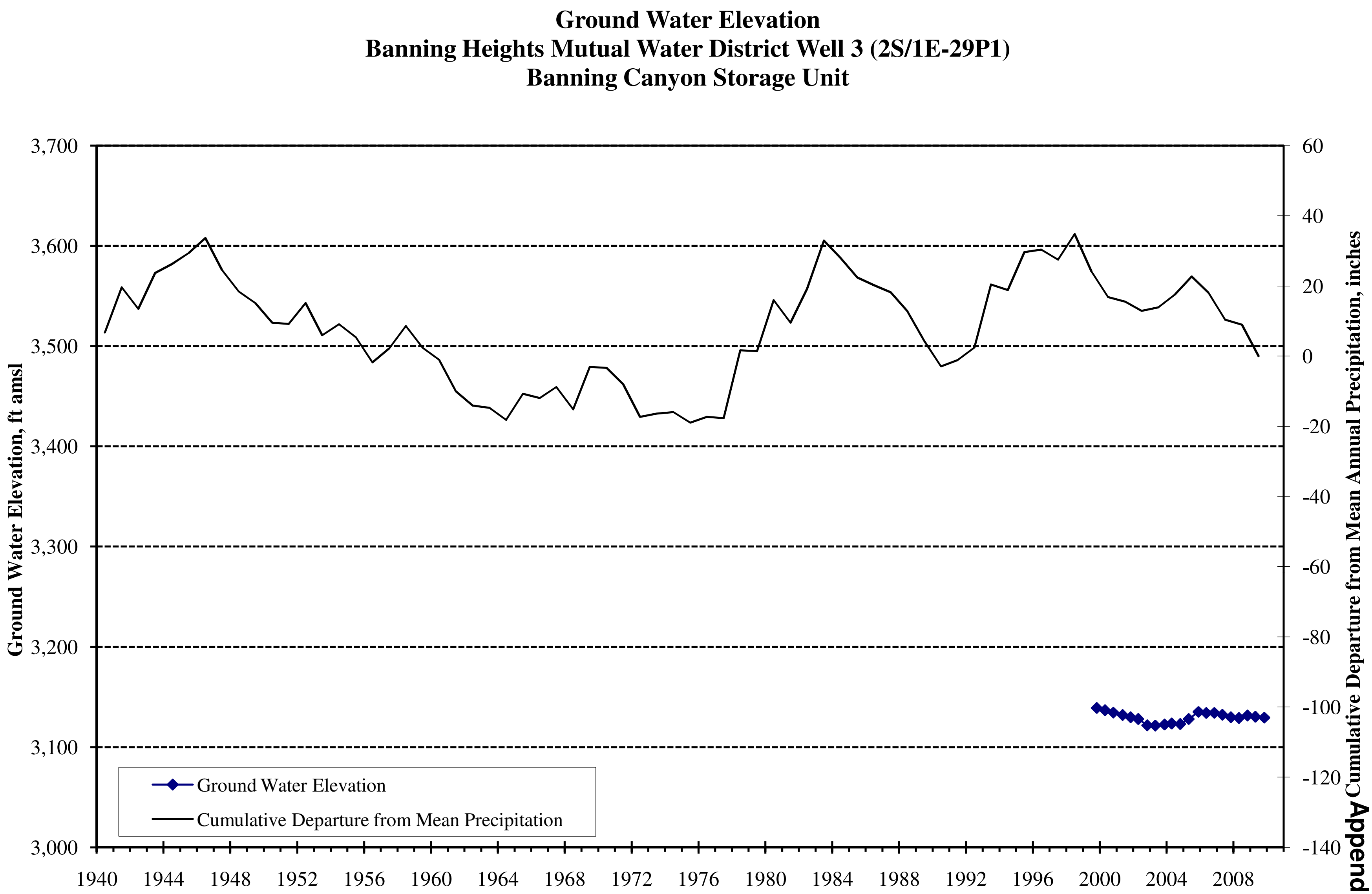
Ground Water Elevation
Banning Heights Mutual Water District Well 3 (2S/1E-29P1)
Banning Canyon Storage Unit
Ground Water Elevation, ft amsl
Cumulative Departure from Mean Annual Precipitation, inches
3,700
3,600
3,500
3,400
3,300
3,200
3,100
3,000
60
40
20
0
-20
-40
-60
-80
-100
-120
-140
1940
1944
1948
1952
1956
1960
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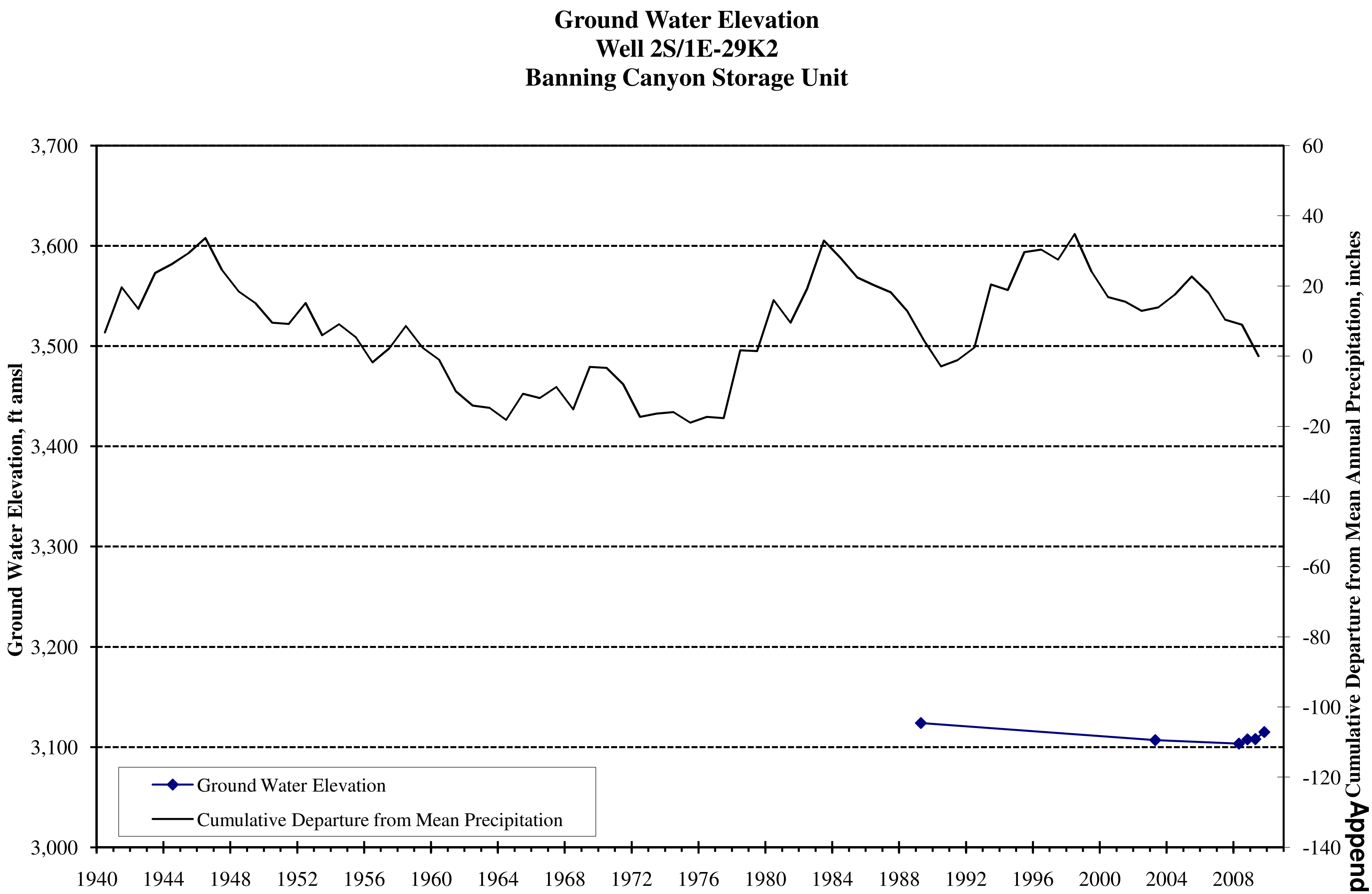
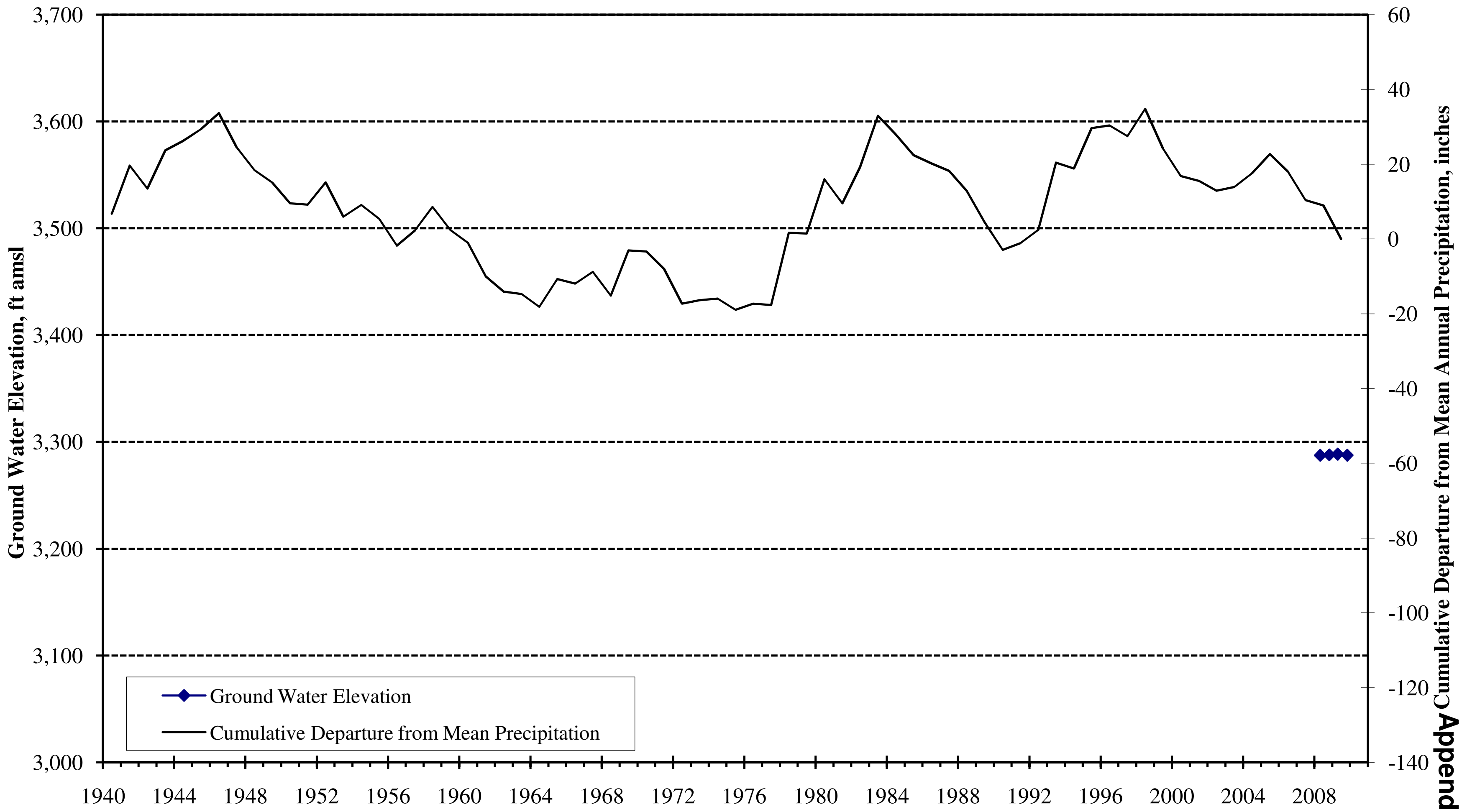
2000
2004
2008
Ground Water Elevation
Cumulative Departure from Mean Precipitation

Appendix B


Ground Water Elevation
Well 2S/1E-29K2
Banning Canyon Storage Unit
3,700
3,600
3,500
3,400
3,300
3,200
3,100
3,000
Ground Water Elevation, ft amsl
60
40
20
0
-20
-40
-60
-80
-100
-120
-140
Cumulative Departure from Mean Annual Precipitation, inches
1940
1944
1948
1952
1956
1960
1964
1968
1972
1976
1980
1984
1988
1992
1996
2000
2004
2008
Ground Water Elevation
Cumulative Departure from Mean Precipitation

Appendix B

Ground Water Elevation
Well 2S/1E-29G1
Banning Canyon Storage Unit



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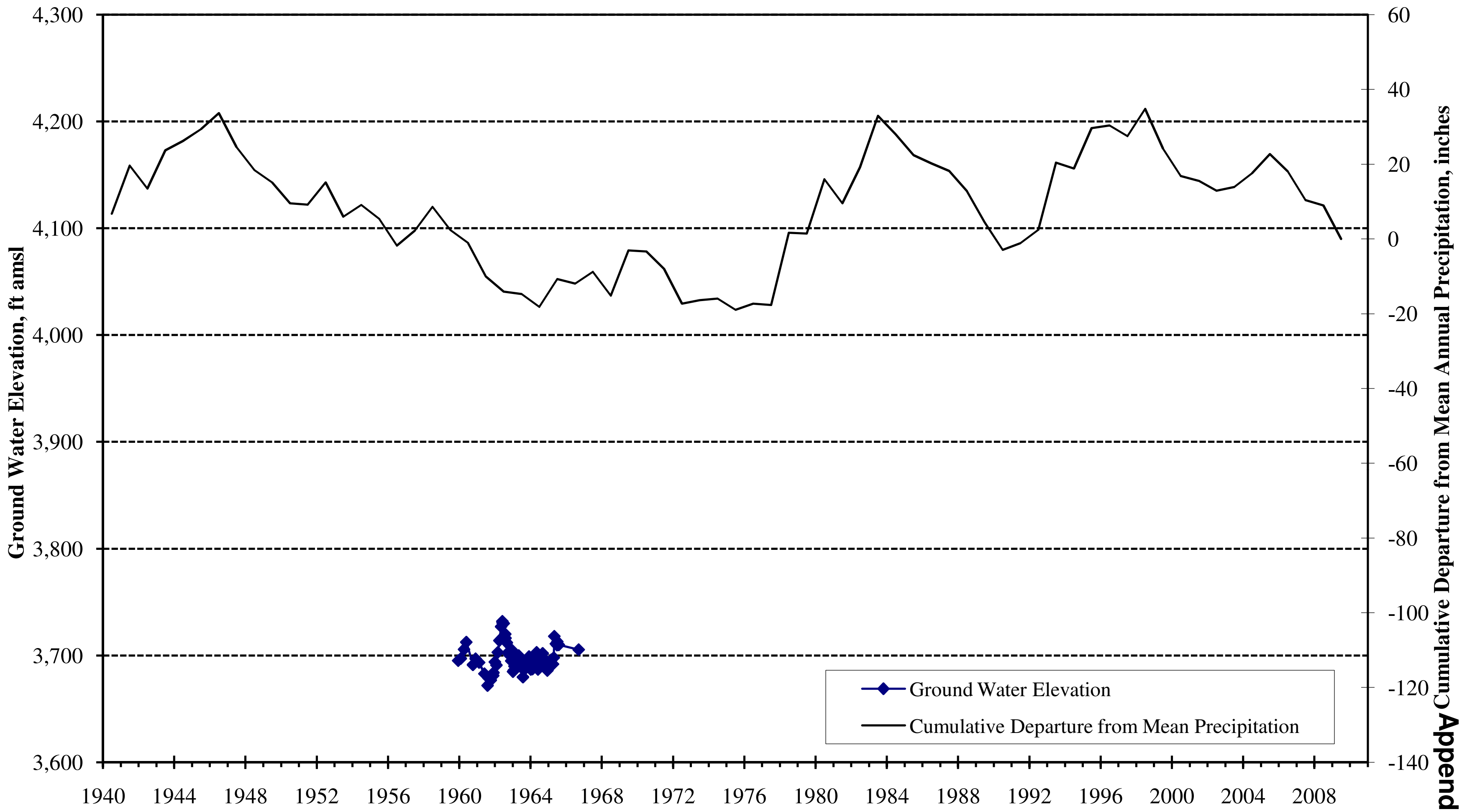
Ground Water Elevation
Well 2S/1E-17F1
Banning Canyon Storage Unit



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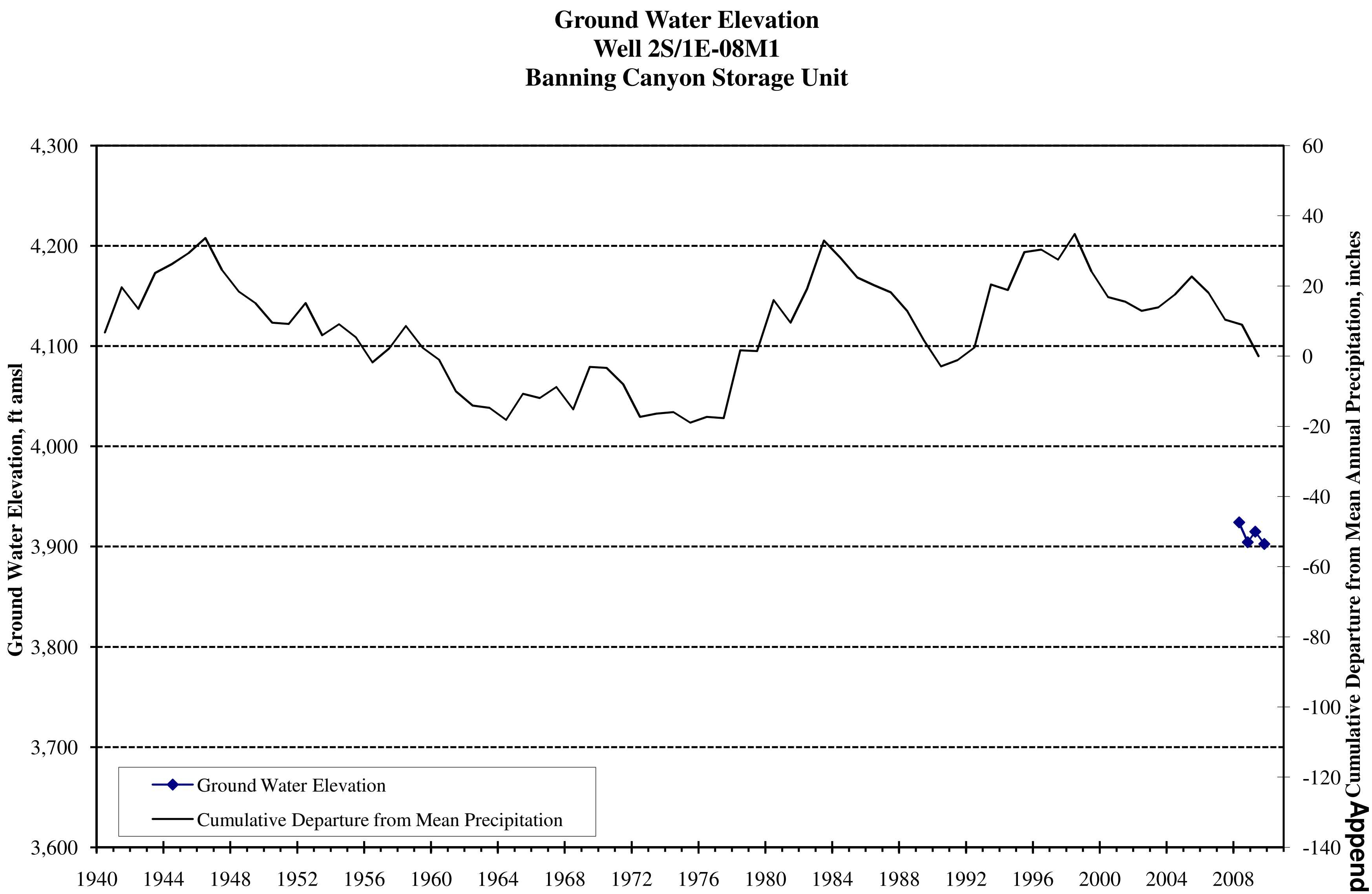
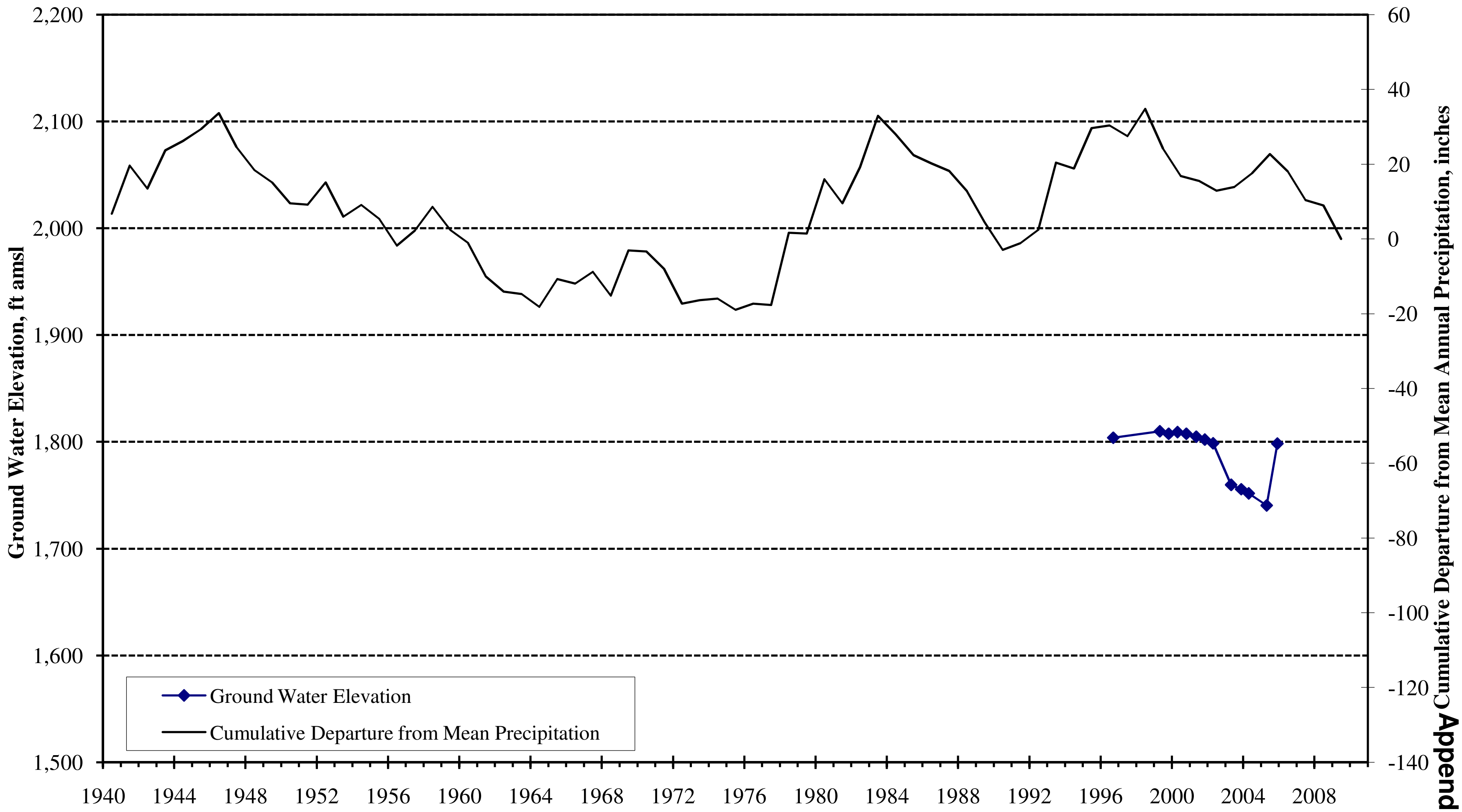

Ground Water Elevation
Well 2S/1E-08M1
Banning Canyon Storage Unit
Ground Water Elevation, ft amsl
Cumulative Departure from Mean Annual Precipitation, inches
4,300
4,200
4,100
4,000
3,900
3,800
3,700
3,600
60
40
20
0
-20
-40
-60
-80
-100
-120
-140
1940
1944
1948
1952
1956
1960
1964
1968
1972
1976
1980
1984
1988
1992
1996
2000
2004
2008
Ground Water Elevation
Cumulative Departure from Mean Precipitation

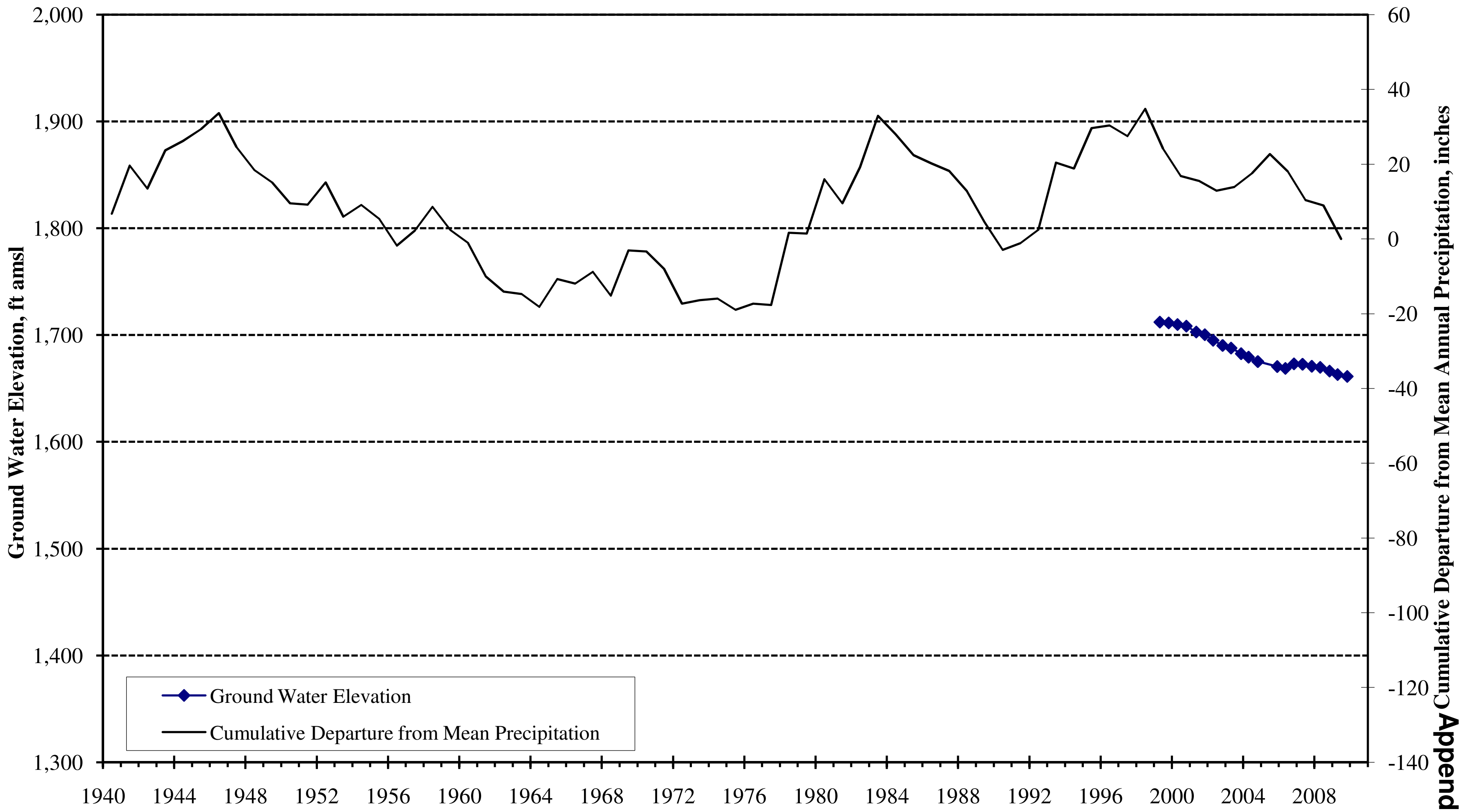
Appendix B

Ground Water Elevation
City of Banning Well C6 (3S/1E-10N1)
Cabazon Storage Unit



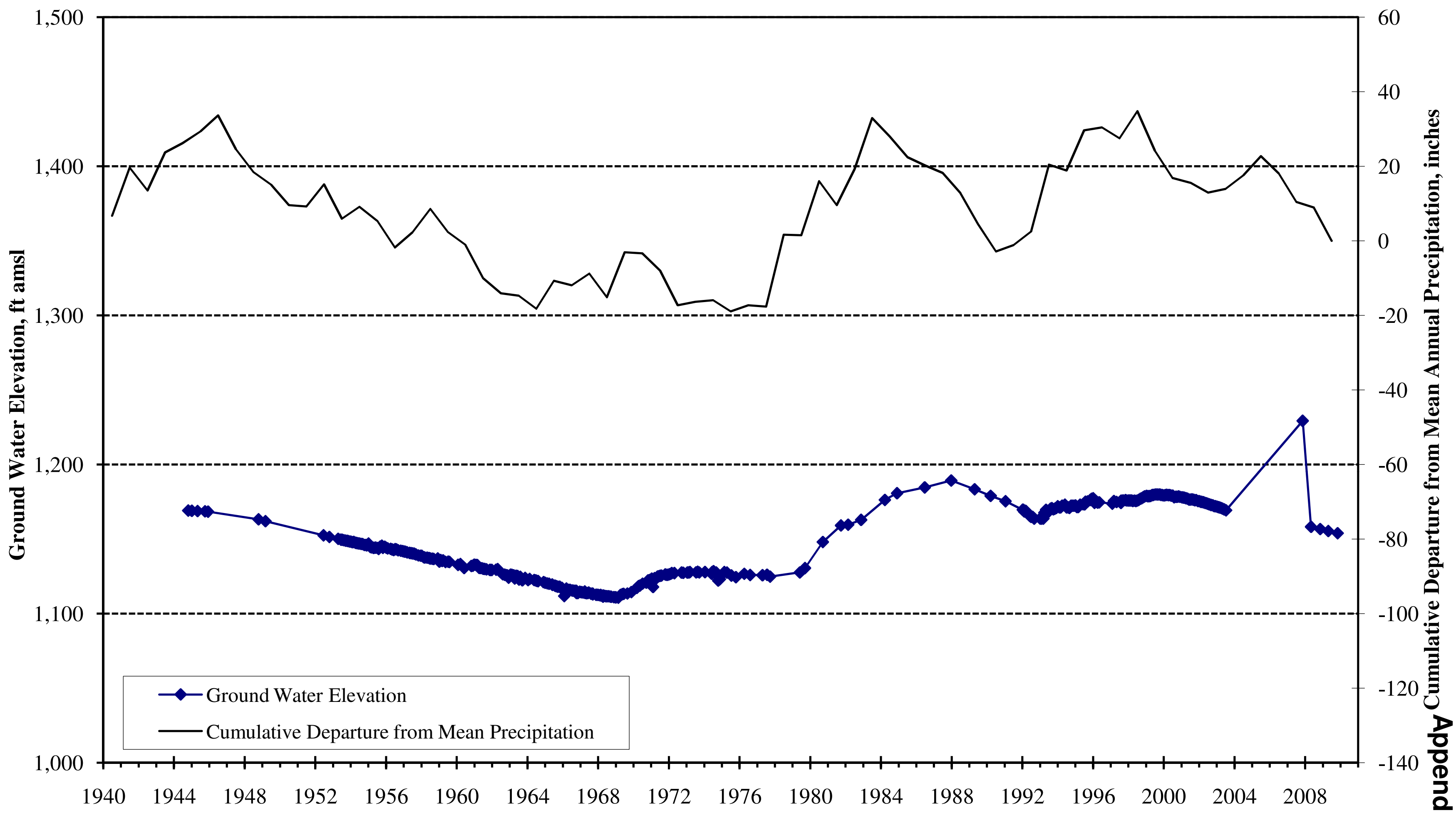
Appendix B

Ground Water Elevation
City of Banning Well R1 (3S/1E-14A1)
Cabazon Storage Unit



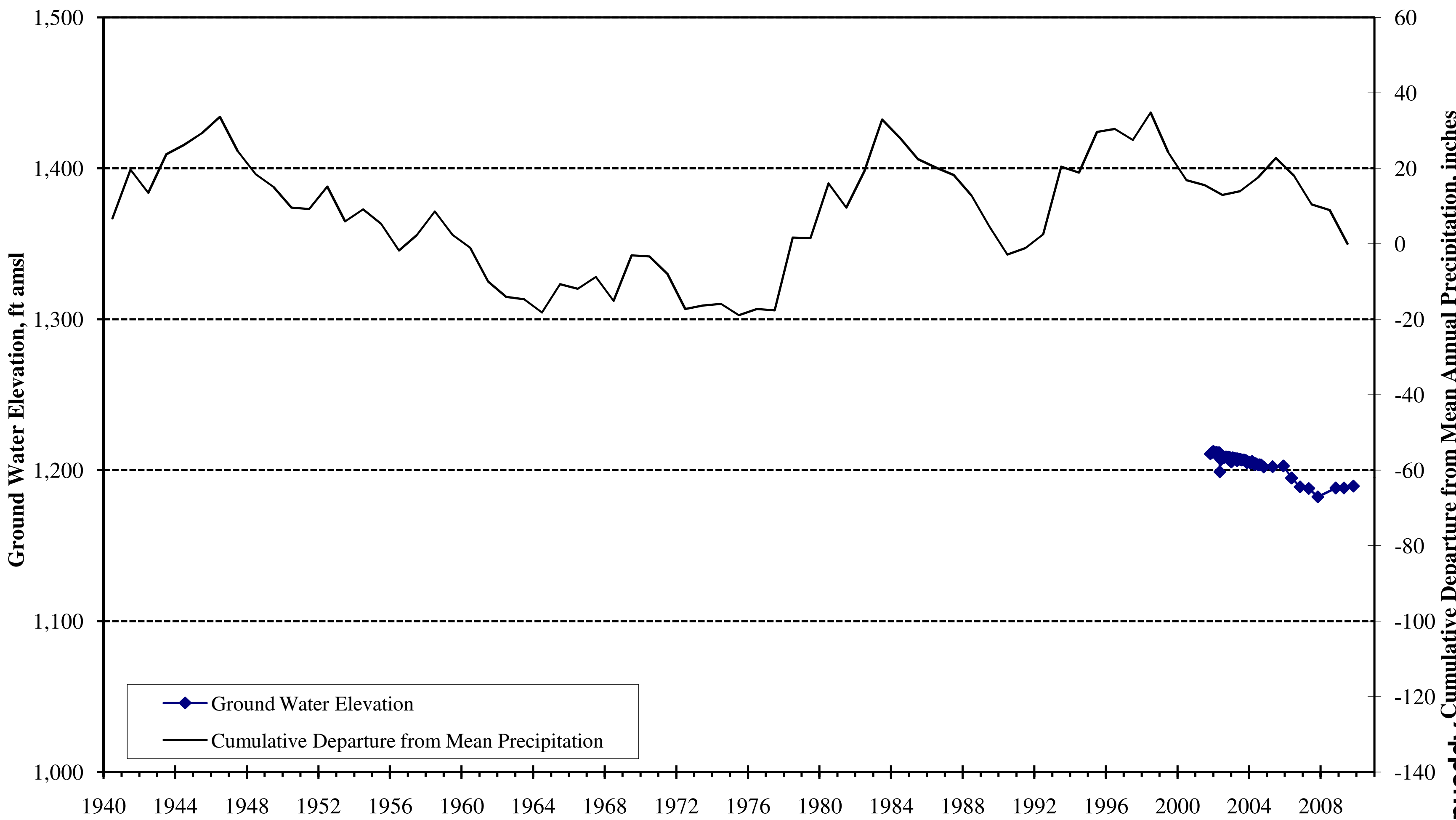
Appendix B

Ground Water Elevation
Well 3S/3E-08M1
Cabazon Storage Unit



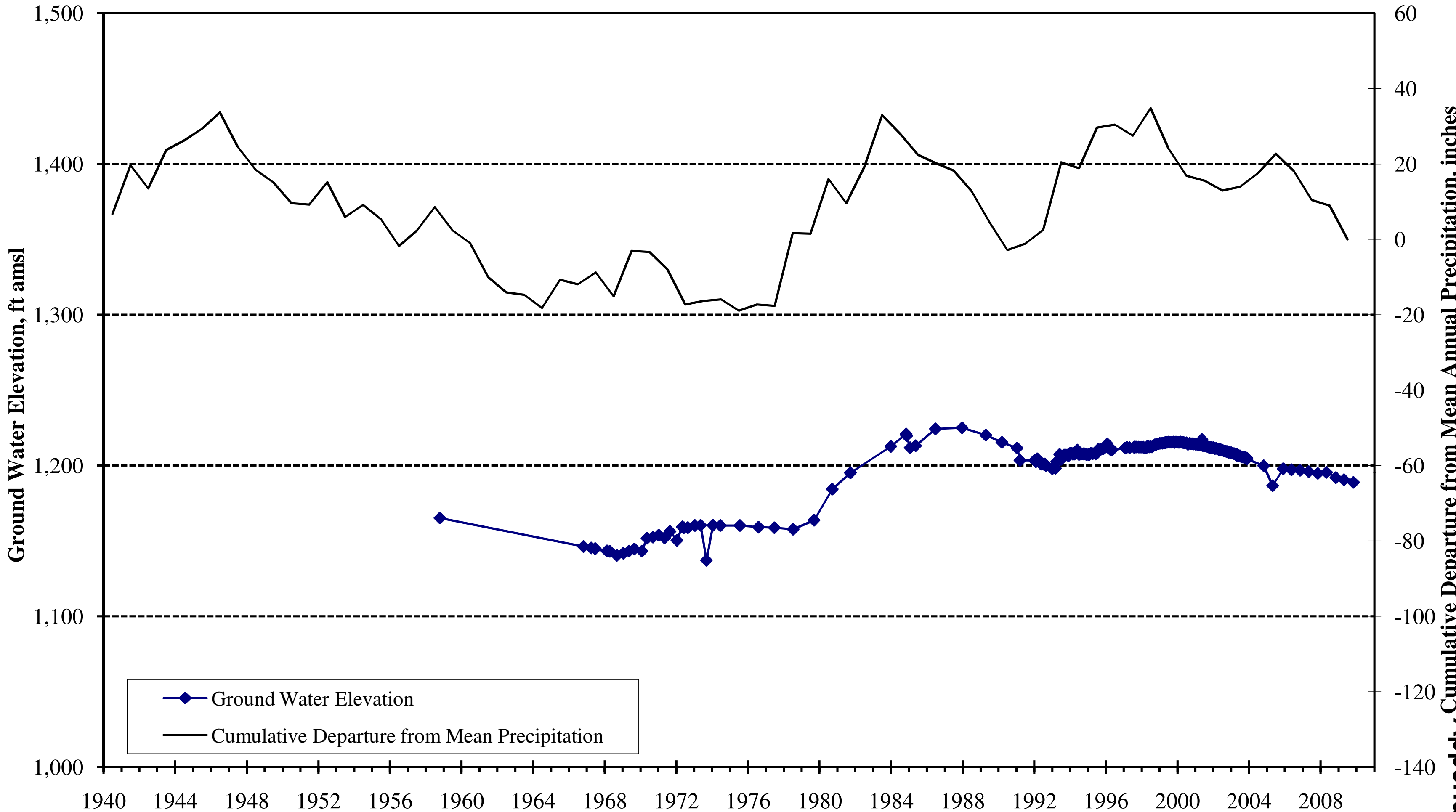
Appendix B

Ground Water Elevation
Well 3S/3E-08A1
Cabazon Storage Unit



Appendix B

Ground Water Elevation
Well 3S/3E-07M1
Cabazon Storage Unit



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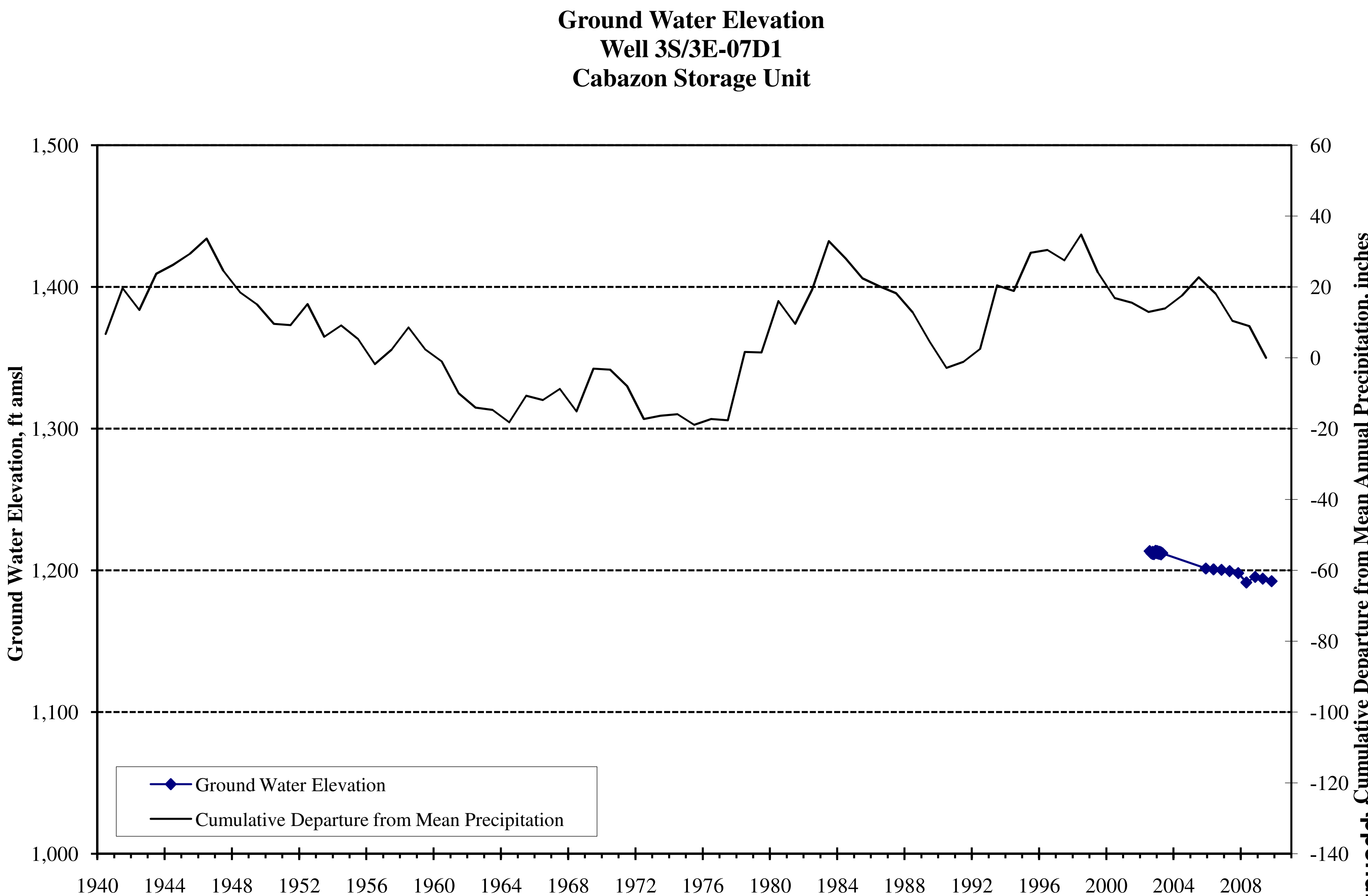
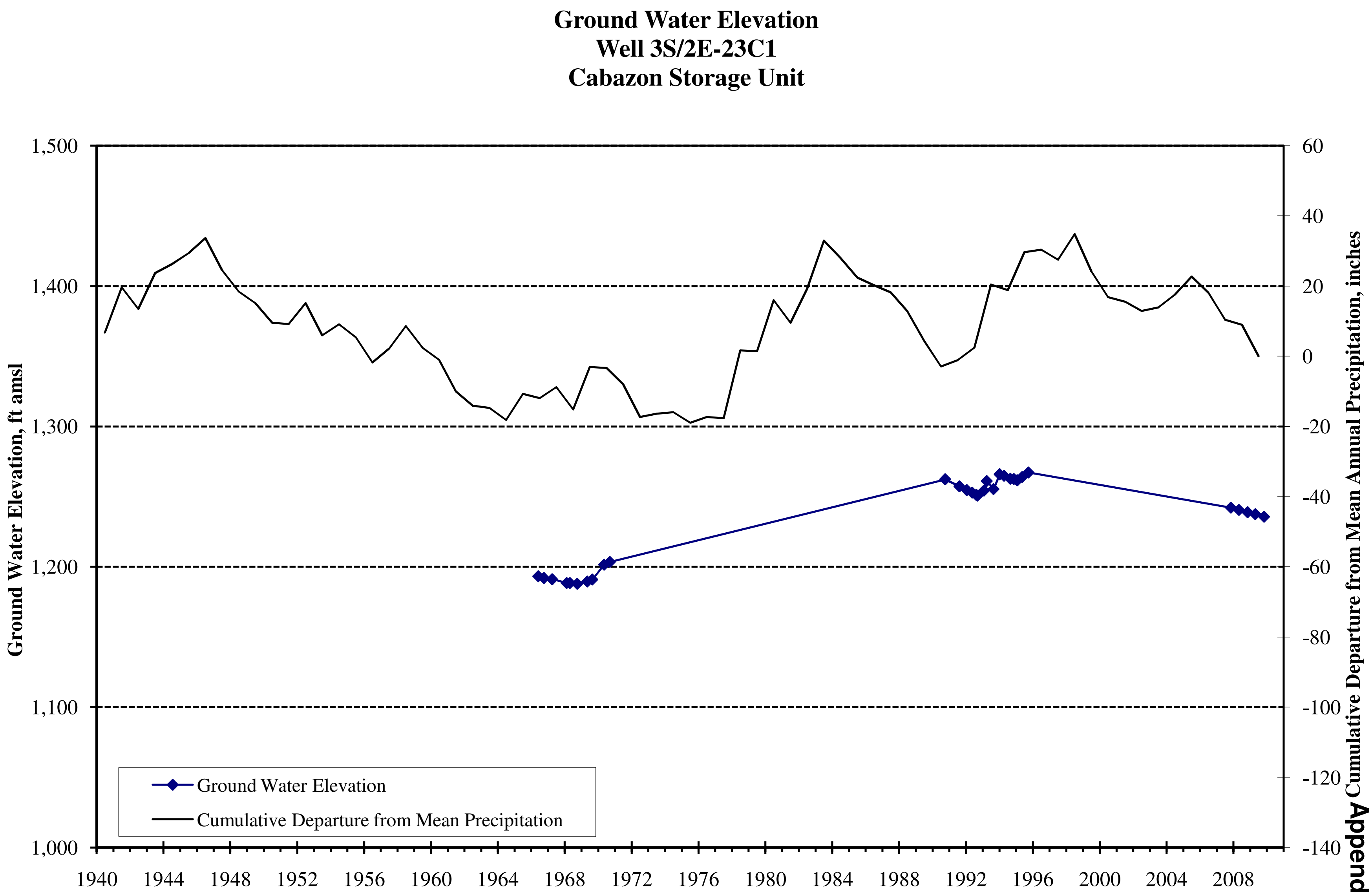

Ground Water Elevation
Well 3S/3E-07D1
Cabazon Storage Unit
Ground Water Elevation, ft amsl
Cumulative Departure from Mean Annual Precipitation, inches
1,500
1,400
1,300
1,200
1,100
1,000
60
40
20
0
-20
-40
-60
-80
-100
-120
-140
1940
1944
1948
1952
1956
1960
1964
1968
1972
1976
1980
1984
1988
1992
1996
2000
2004
2008
Ground Water Elevation
Cumulative Departure from Mean Precipitation

Appendix B


Ground Water Elevation
Well 3S/2E-23C1
Cabazon Storage Unit
Ground Water Elevation, ft amsl
Cumulative Departure from Mean Annual Precipitation, inches
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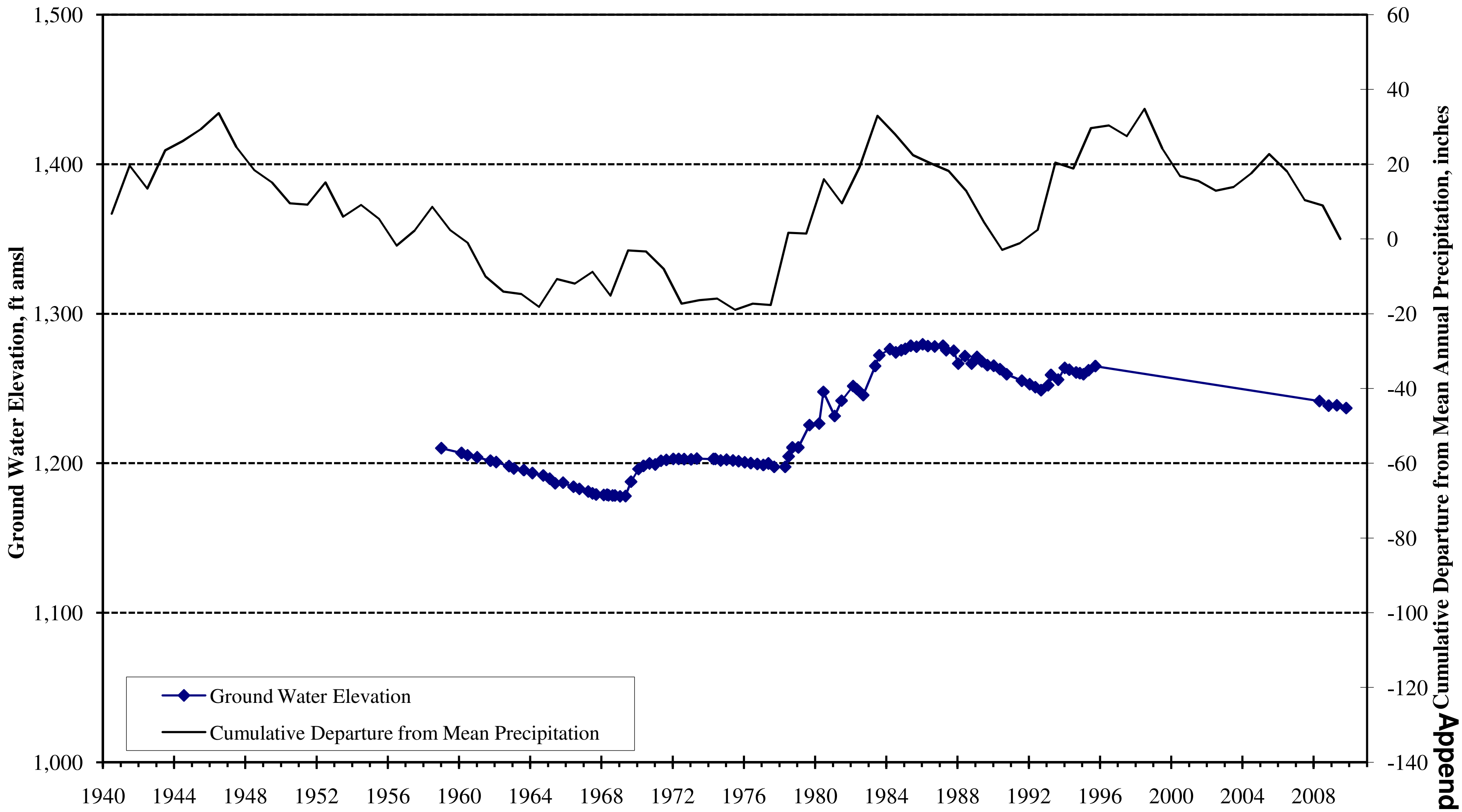
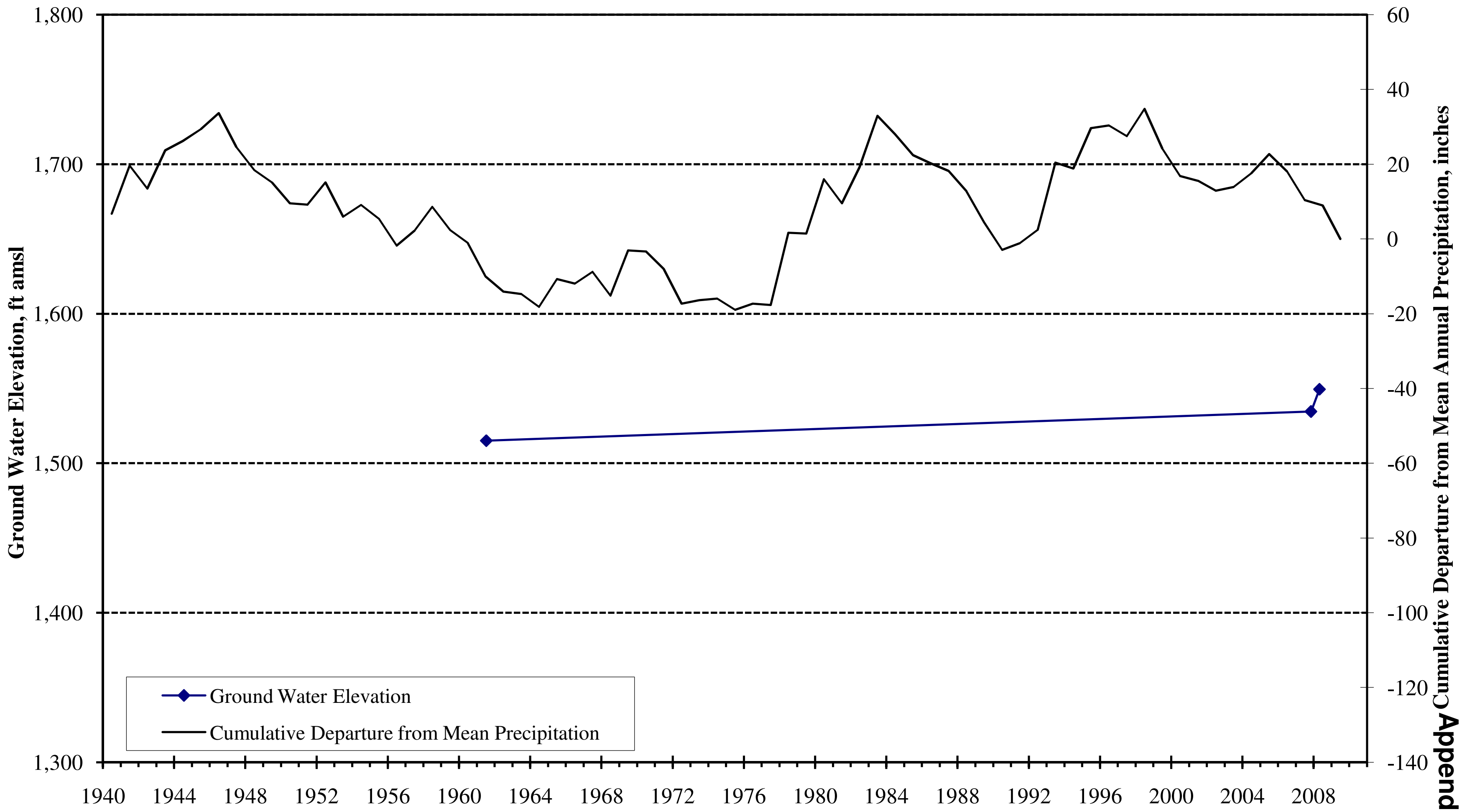
1,300
1,200
1,100
1,000
60
40
20
0
-20
-40
-60
-80
-100
-120
-140
1940
1944
1948
1952
1956
1960
1964
1968
1972
1976
1980
1984
1988
1992
1996
2000
2004
2008
Ground Water Elevation
Cumulative Departure from Mean Precipitation

Appendix B

Ground Water Elevation
Well 3S/2E-23B1
Cabazon Storage Unit

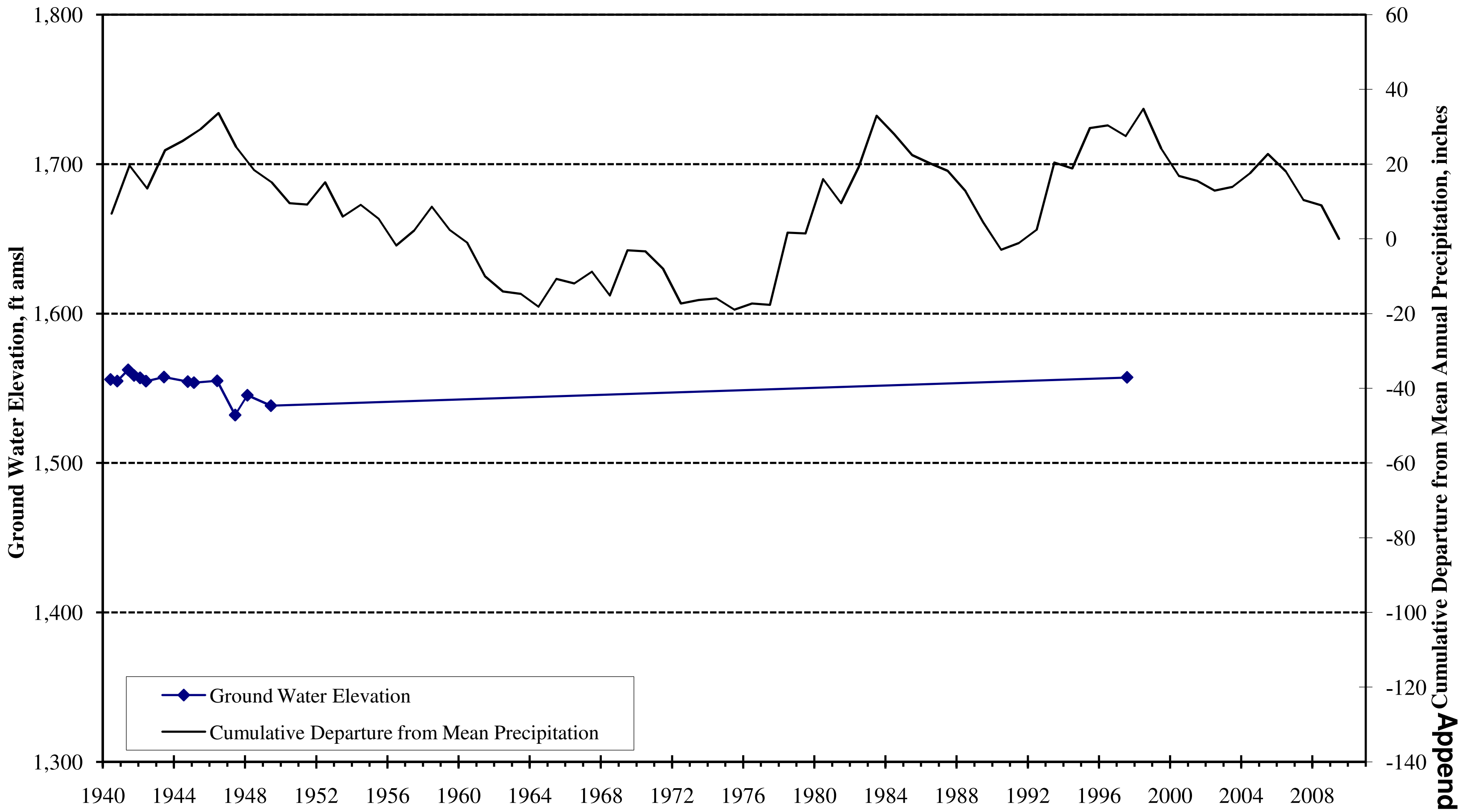


Ground Water Elevation
Well 3S/2E-22B1
Cabazon Storage Unit



Appendix B

Ground Water Elevation
Well 3S/2E-18K1
Cabazon Storage Unit



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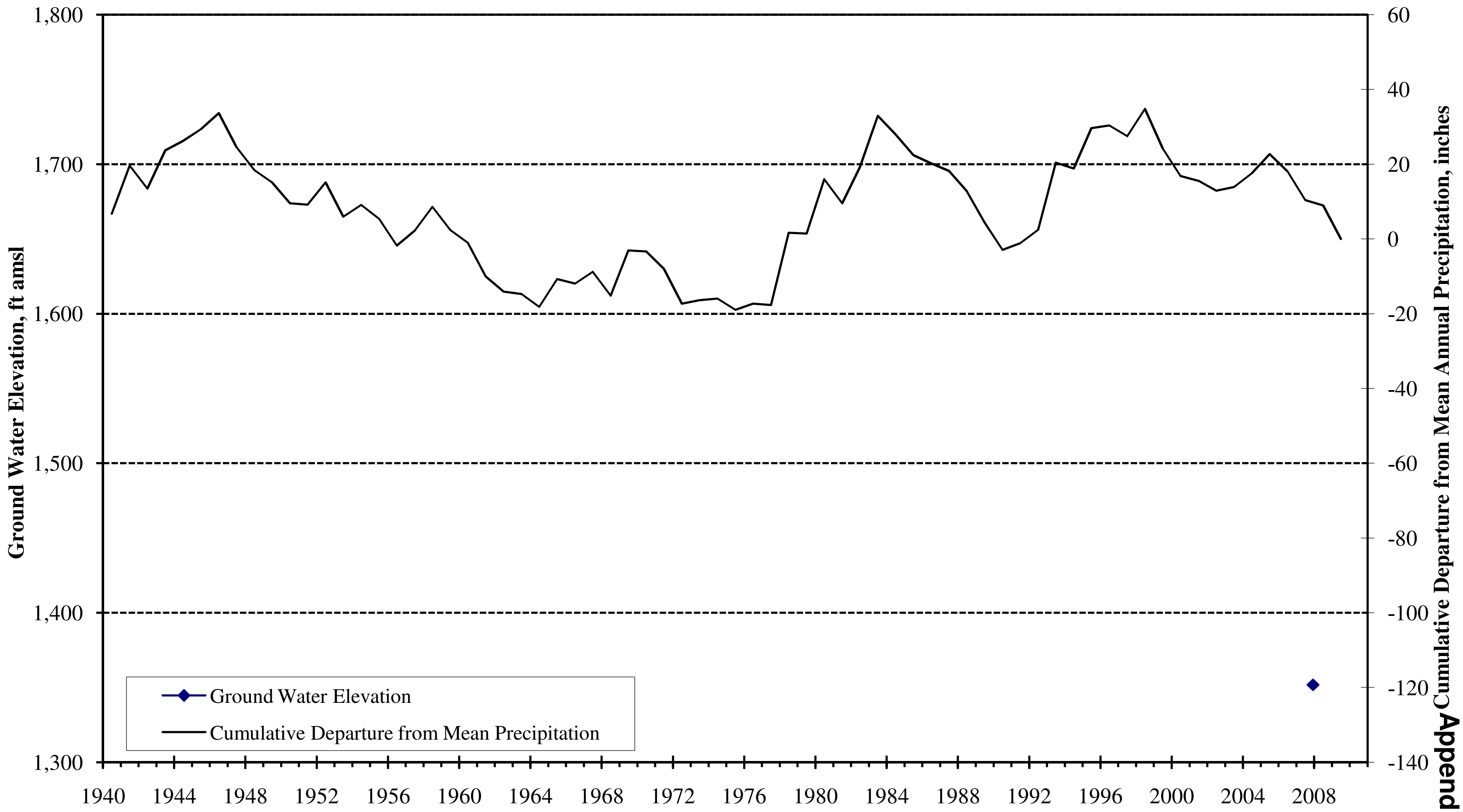
Ground Water Elevation
Well 3S/2E-15P3
Cabazon Storage Unit



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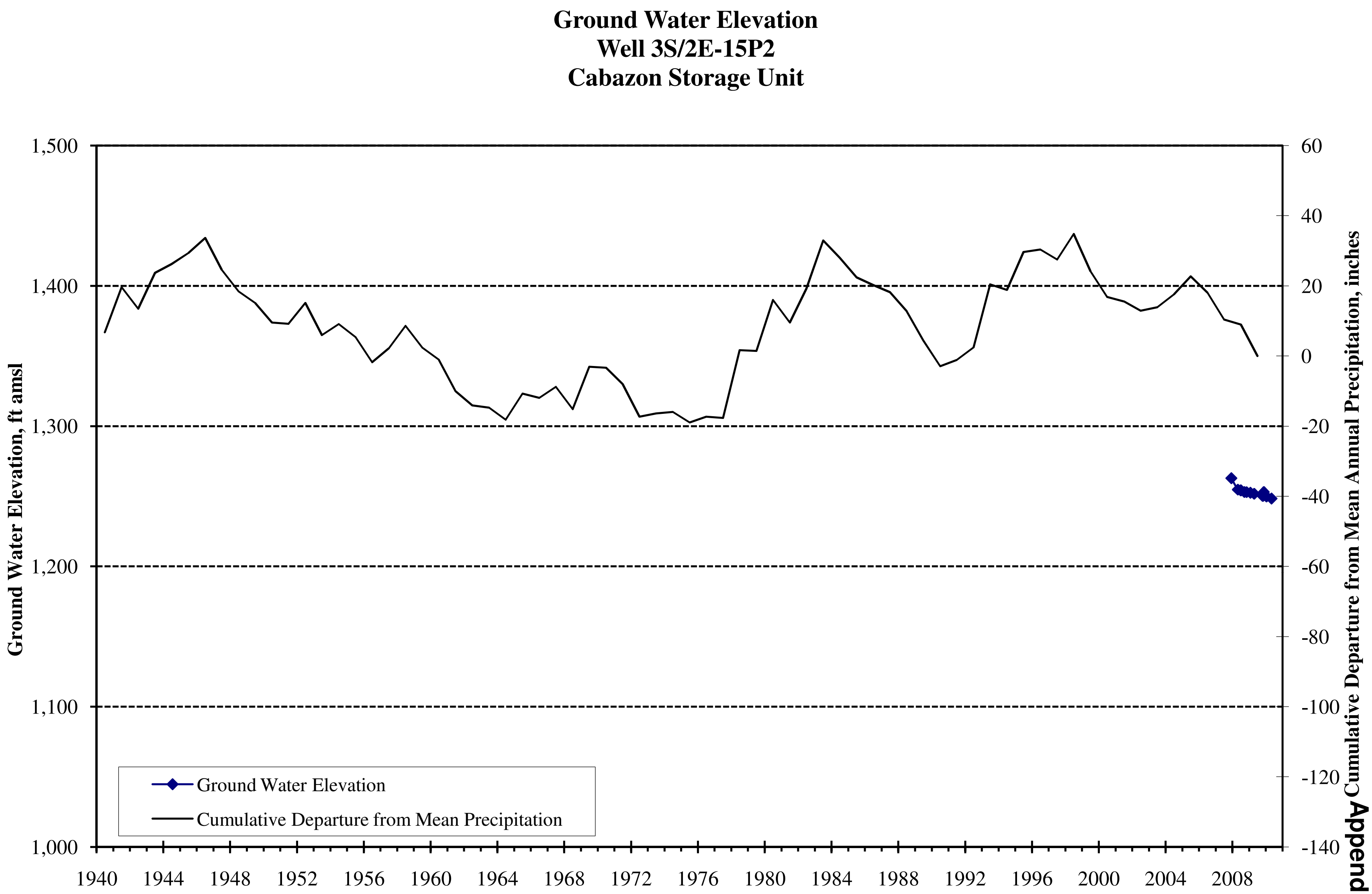
Ground Water Elevation
Well 3S/2E-15P2
Cabazon Storage Unit
Ground Water Elevation, ft amsl
Cumulative Departure from Mean Annual Precipitation, inches
1,500
1,400
1,300
1,200
1,100
1,000
60
40
20
0
-20
-40
-60
-80
-100
-120
-140
1940
1944
1948
1952
1956
1960
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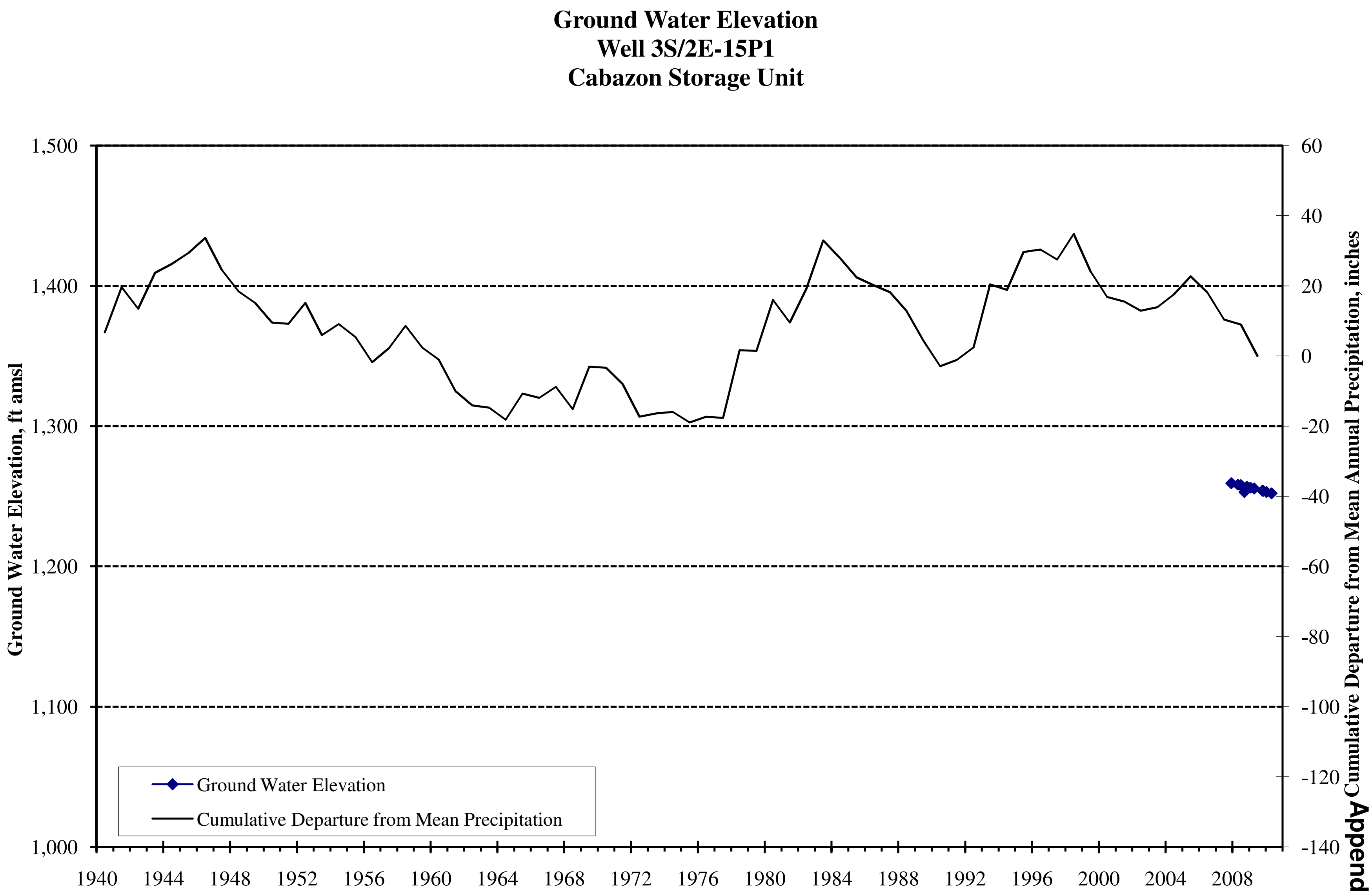
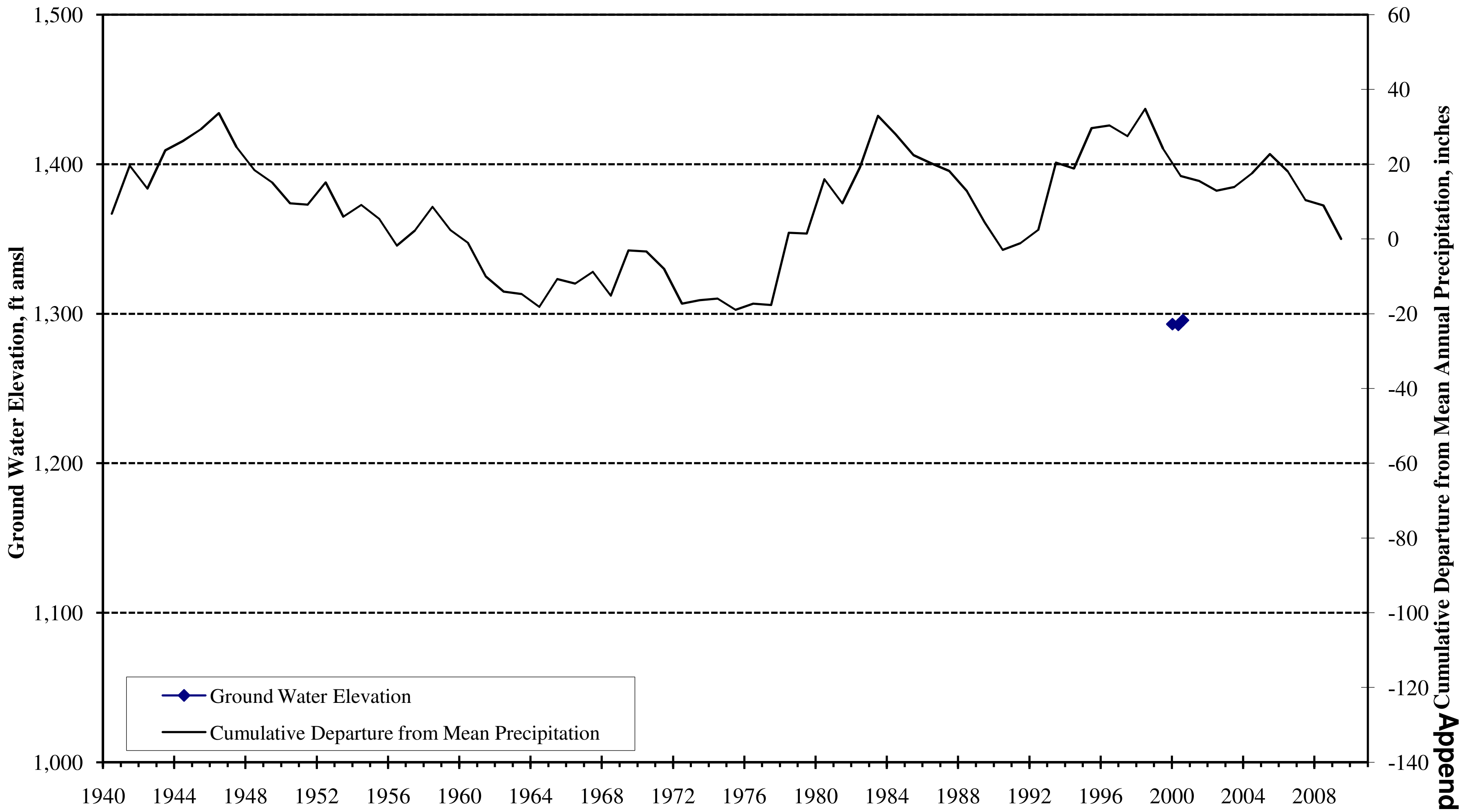
2008
Ground Water Elevation
Cumulative Departure from Mean Precipitation

Appendix B


Ground Water Elevation
Well 3S/2E-15P1
Cabazon Storage Unit
Ground Water Elevation, ft amsl
Cumulative Departure from Mean Annual Precipitation, inches
1,500
1,400
1,300
1,200
1,100
1,000
60
40
20
0
-20
-40
-60
-80
-100
-120
-140
1940
1944
1948
1952
1956
1960
1964
1968
1972
1976
1980
1984
1988
1992
1996
2000
2004
2008
Ground Water Elevation
Cumulative Departure from Mean Precipitation

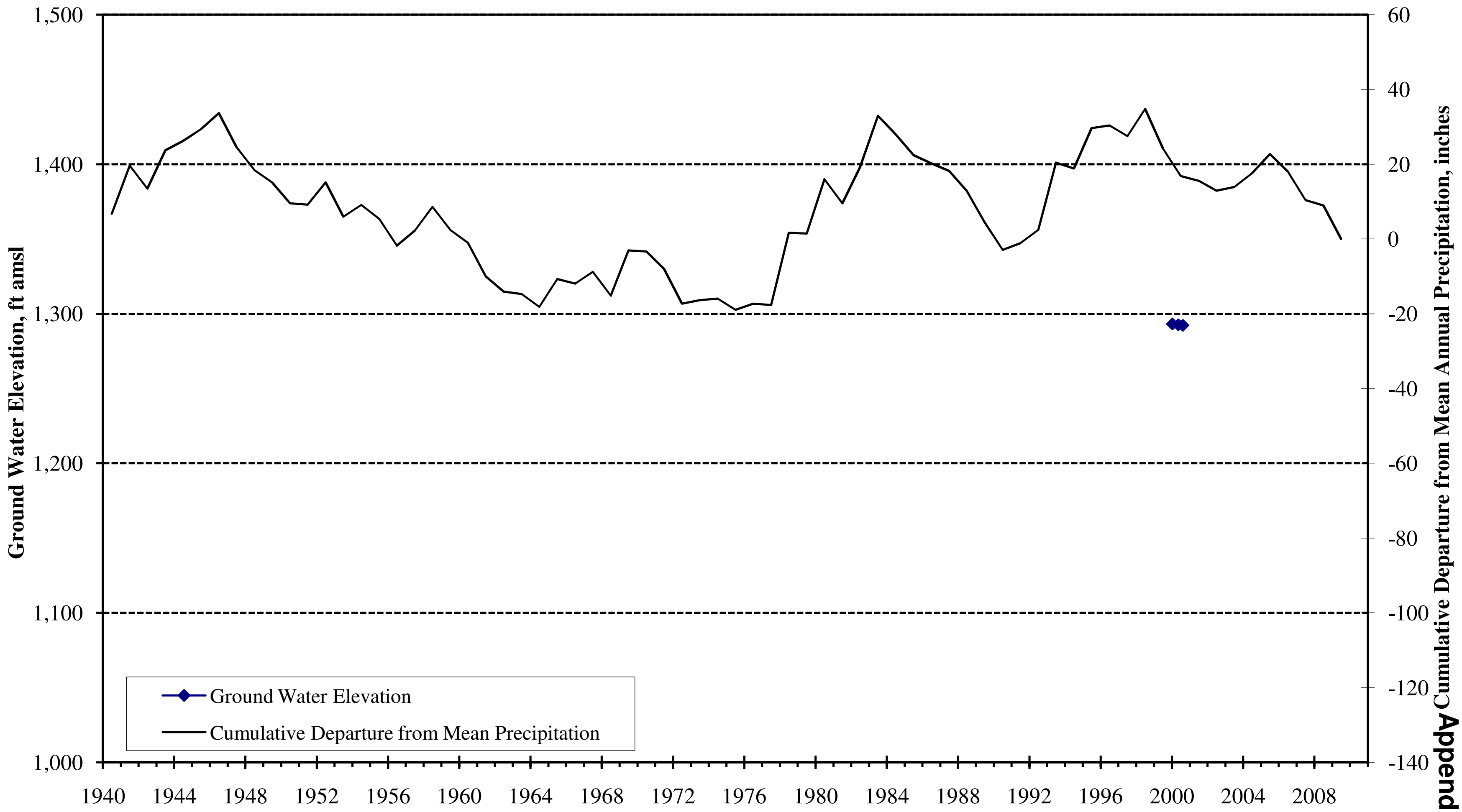
Appendix B

Ground Water Elevation
Well 3S/2E-10N4
Cabazon Storage Unit



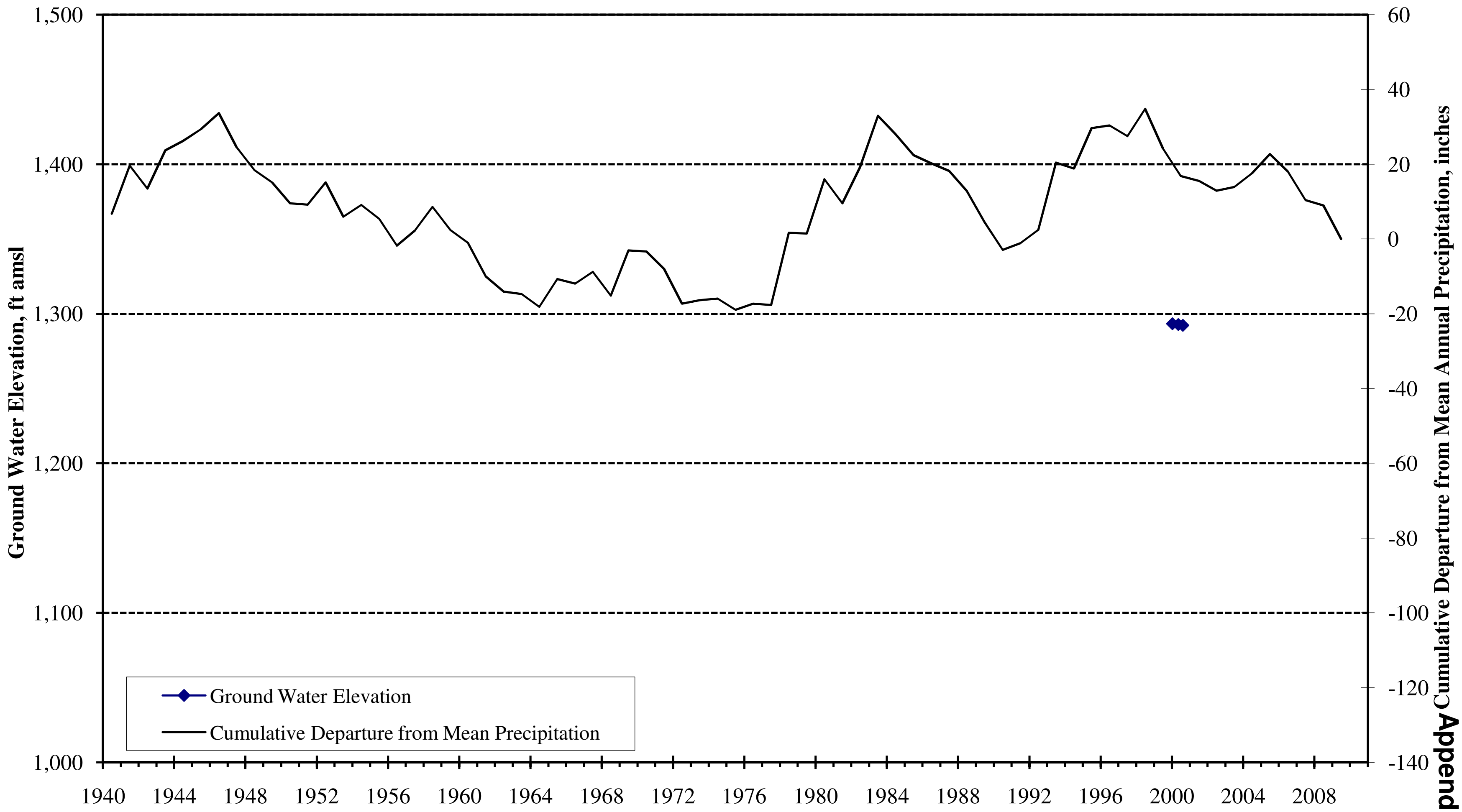
Appendix B

Ground Water Elevation
Well 3S/2E-10N3
Cabazon Storage Unit



Appendix B

Ground Water Elevation
Well 3S/2E-10N2
Cabazon Storage Unit



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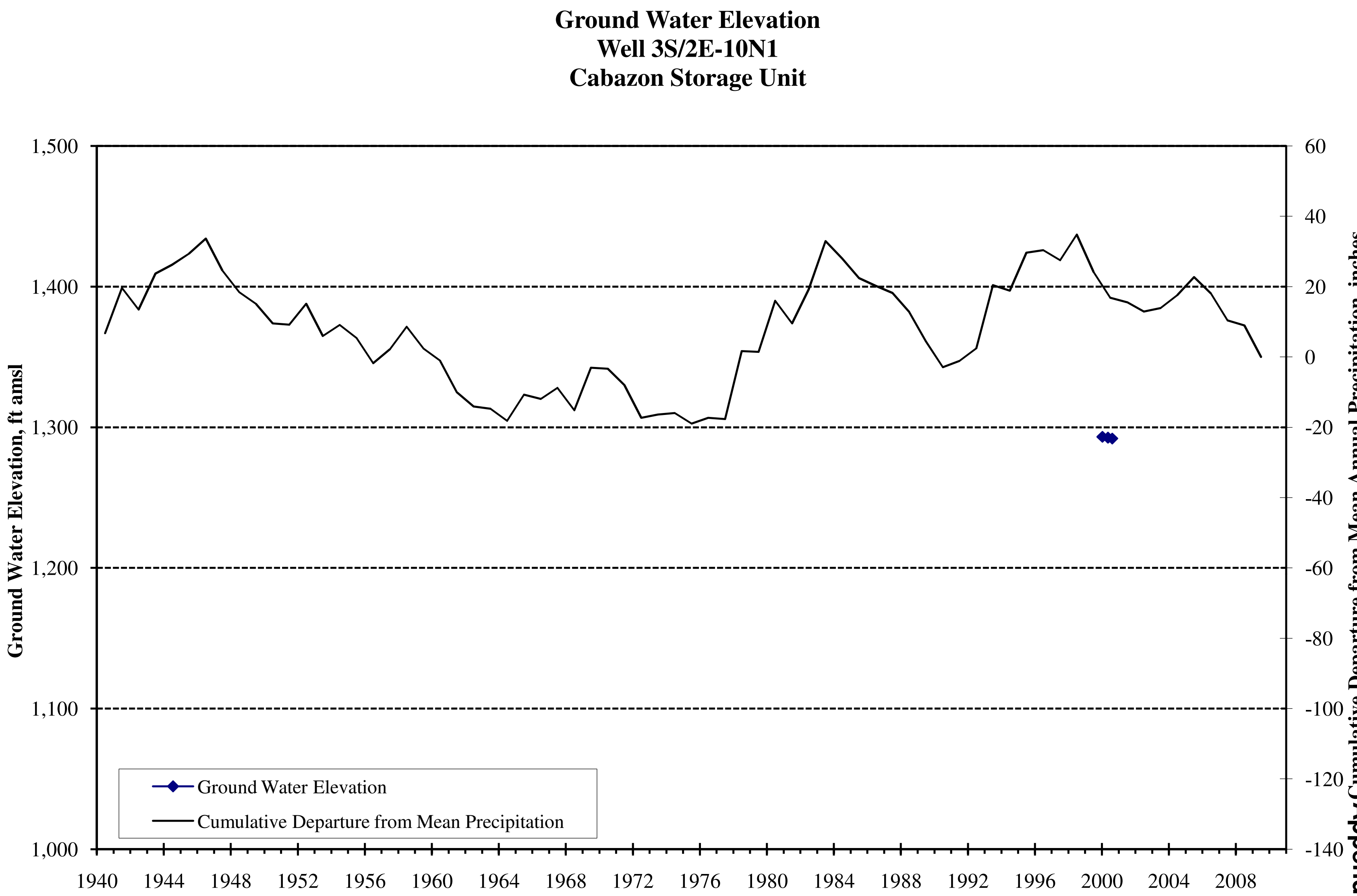
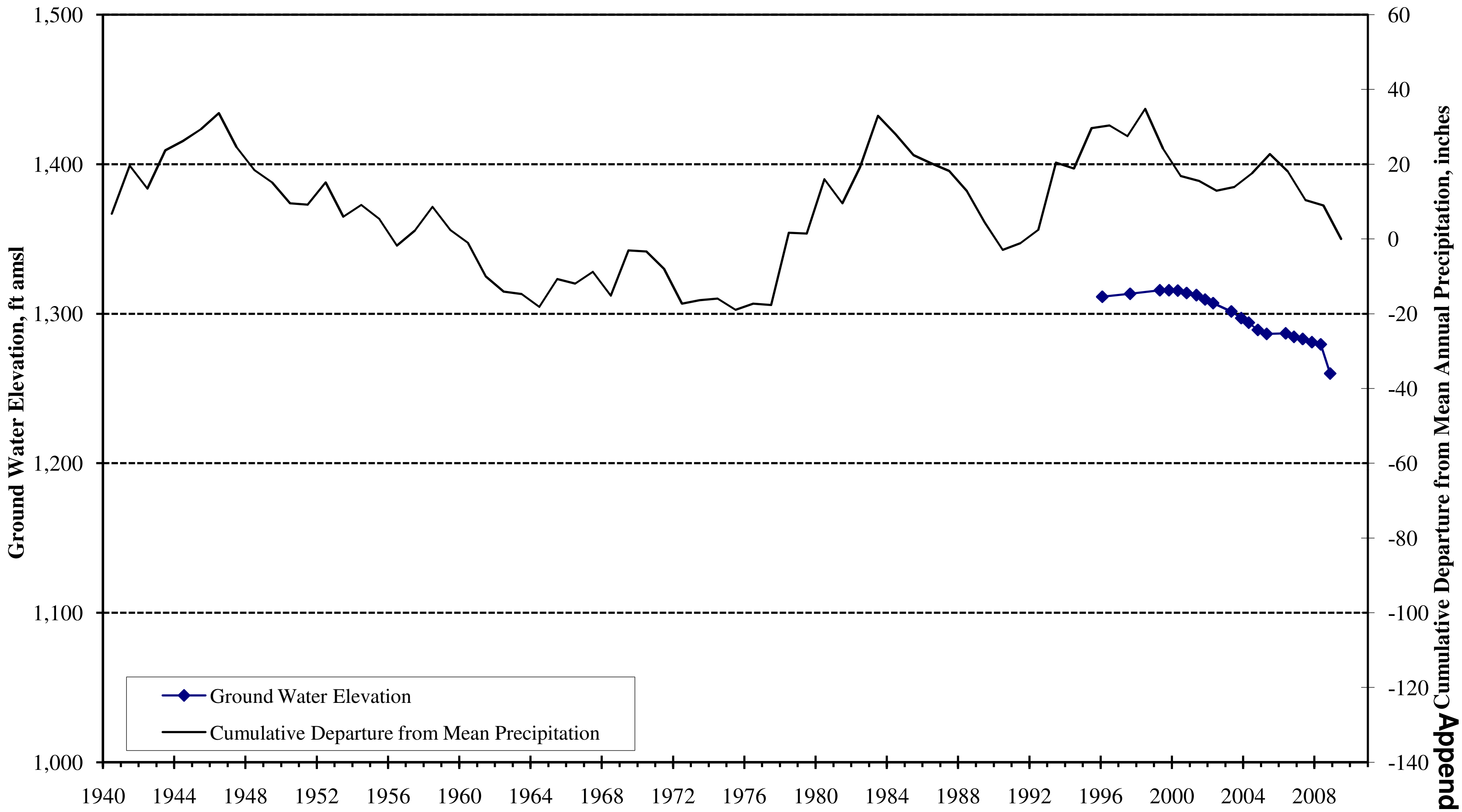

Ground Water Elevation
Well 3S/2E-10N1
Cabazon Storage Unit
Ground Water Elevation, ft amsl
Cumulative Departure from Mean Annual Precipitation, inches
1,500
1,400
1,300
1,200
1,100
1,000
60
40
20
0
-20
-40
-60
-80
-100
-120
-140
1940
1944
1948
1952
1956
1960
1964
1968
1972
1976
1980
1984
1988
1992
1996
2000
2004
2008
Ground Water Elevation
Cumulative Departure from Mean Precipitation

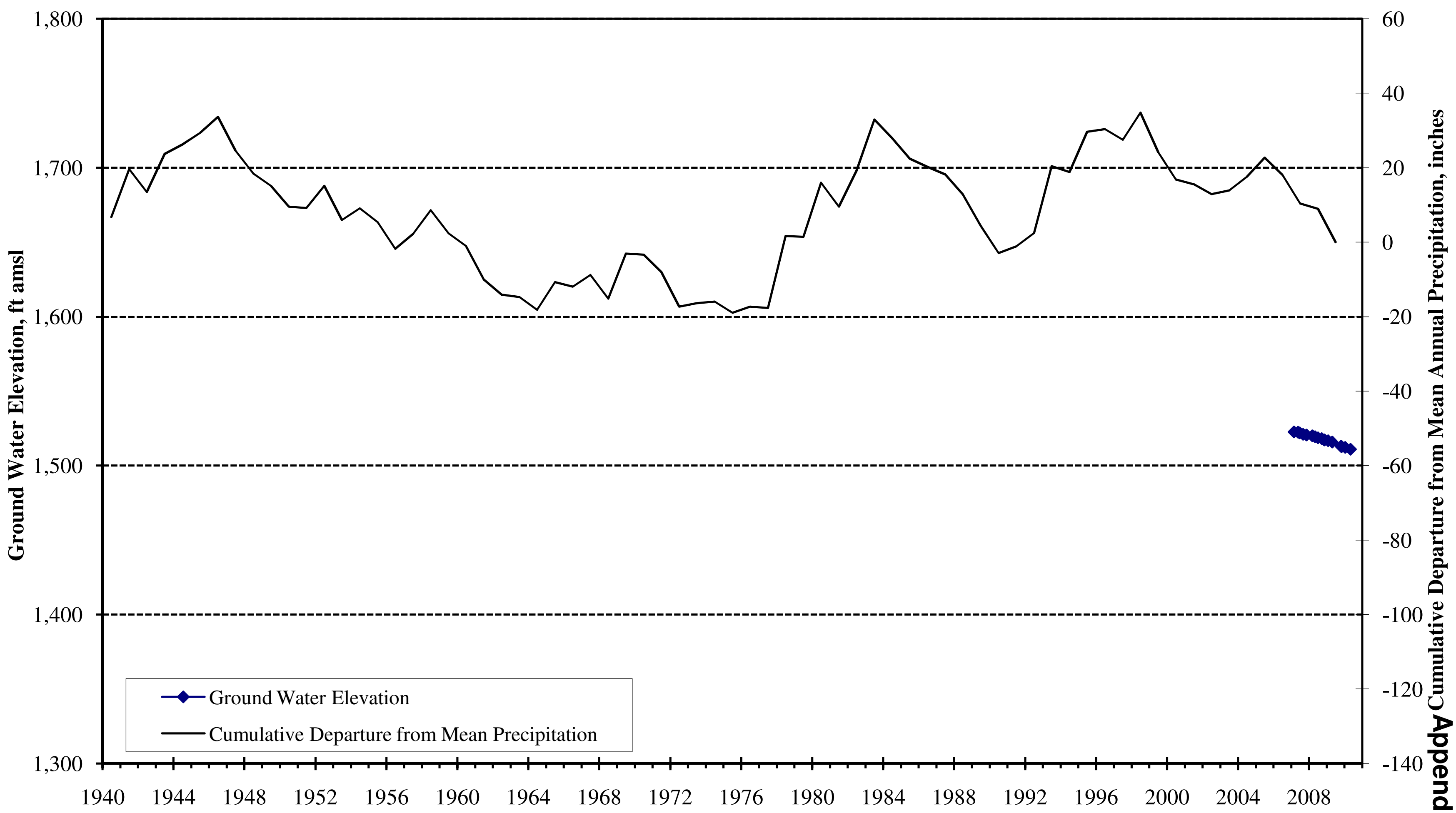
Appendix B

Ground Water Elevation
Well 3S/2E-09E1
Cabazon Storage Unit



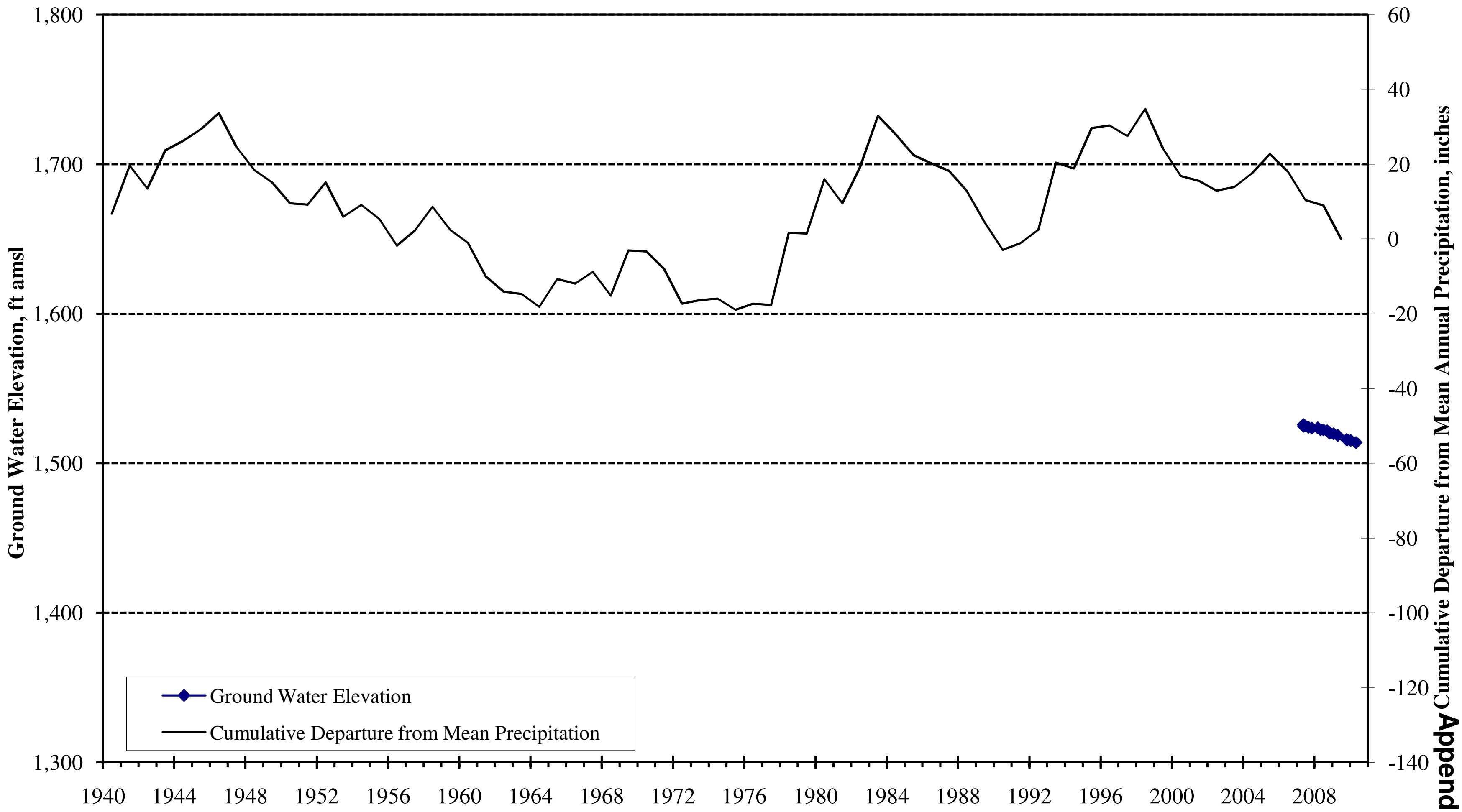
Appendix B

Ground Water Elevation
Well 3S/2E-07P4
Cabazon Storage Unit



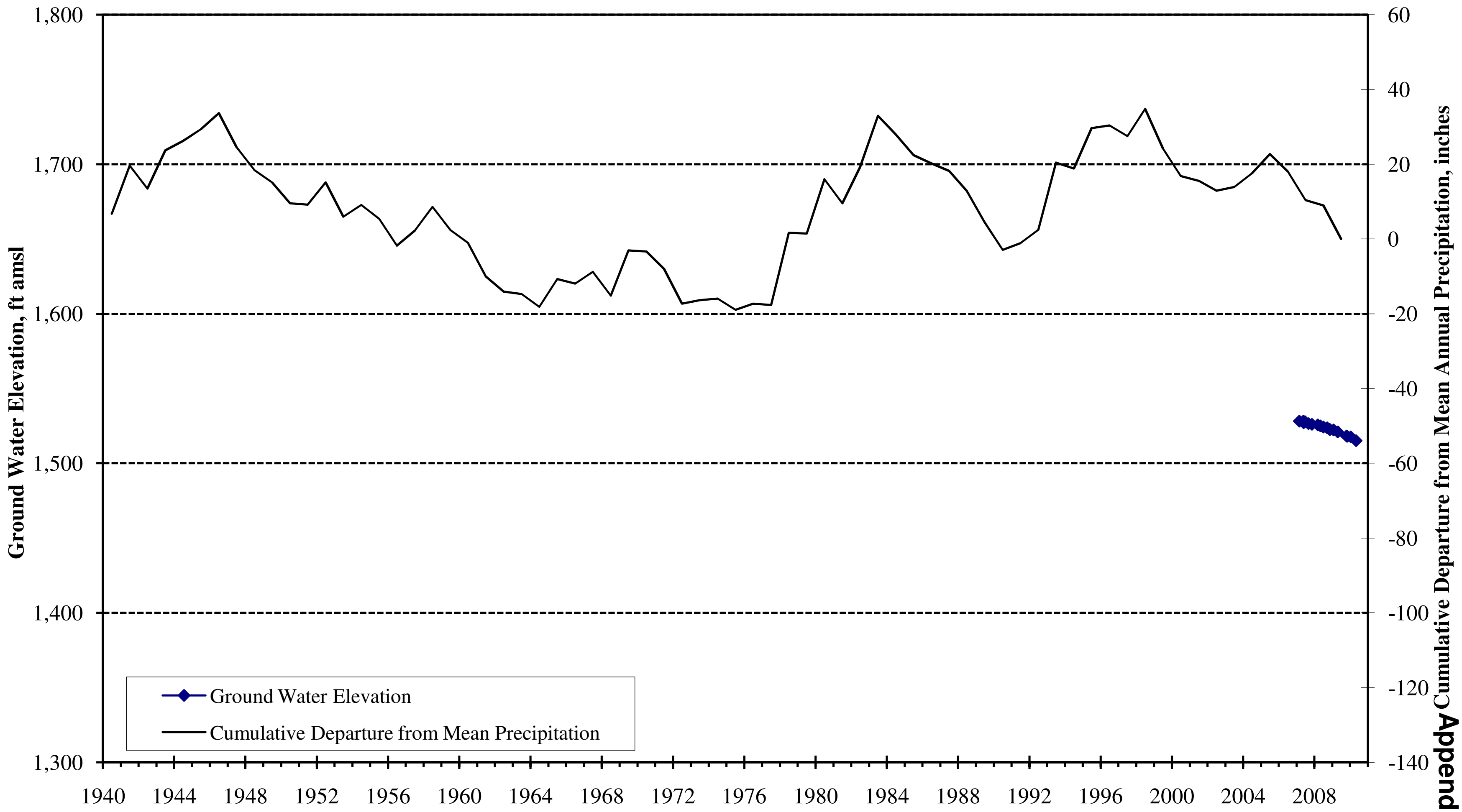
Appendix B

Ground Water Elevation
Well 3S/2E-07P3
Cabazon Storage Unit



Appendix B

Ground Water Elevation
Well 3S/2E-07P2
Cabazon Storage Unit



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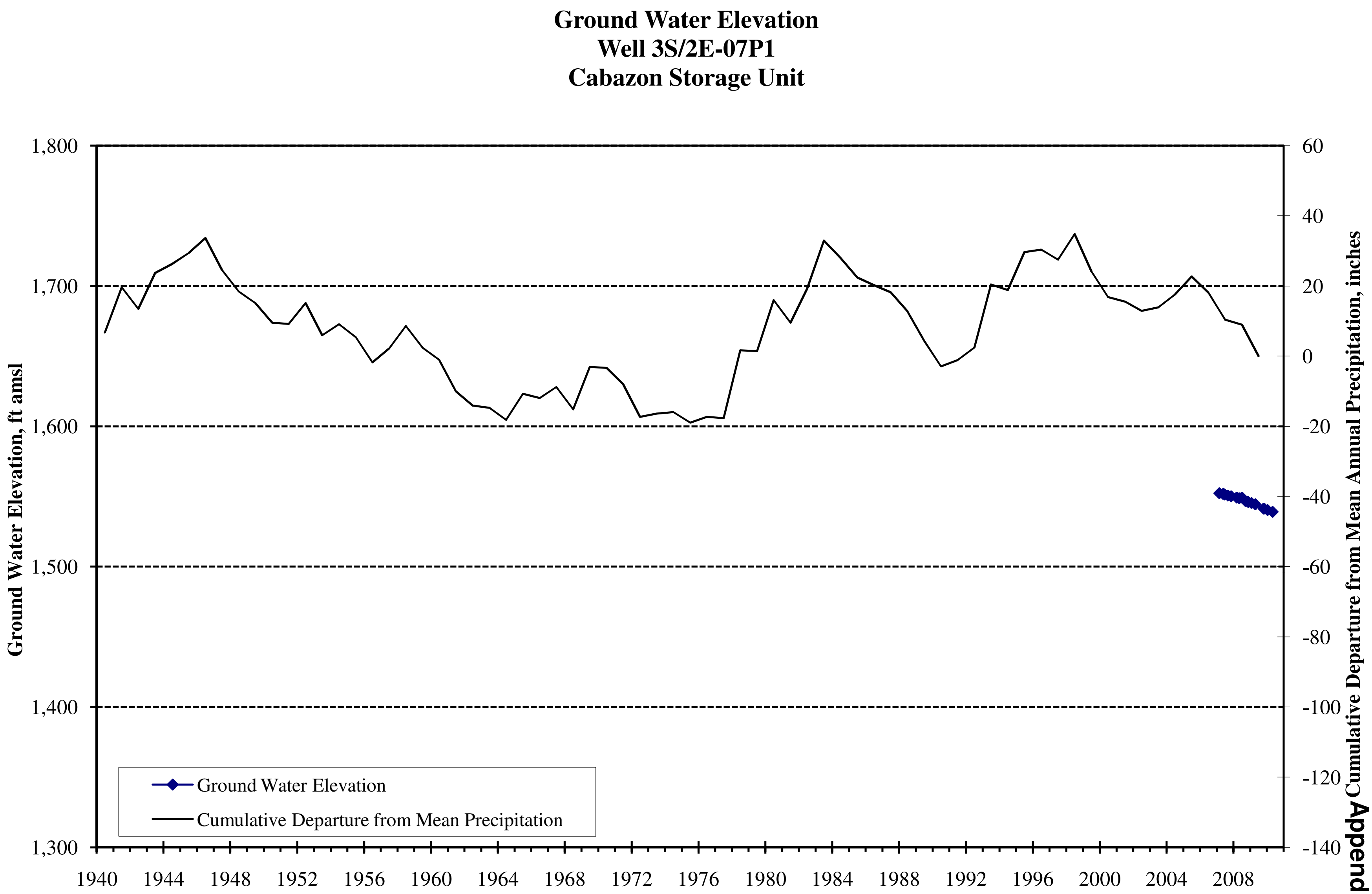
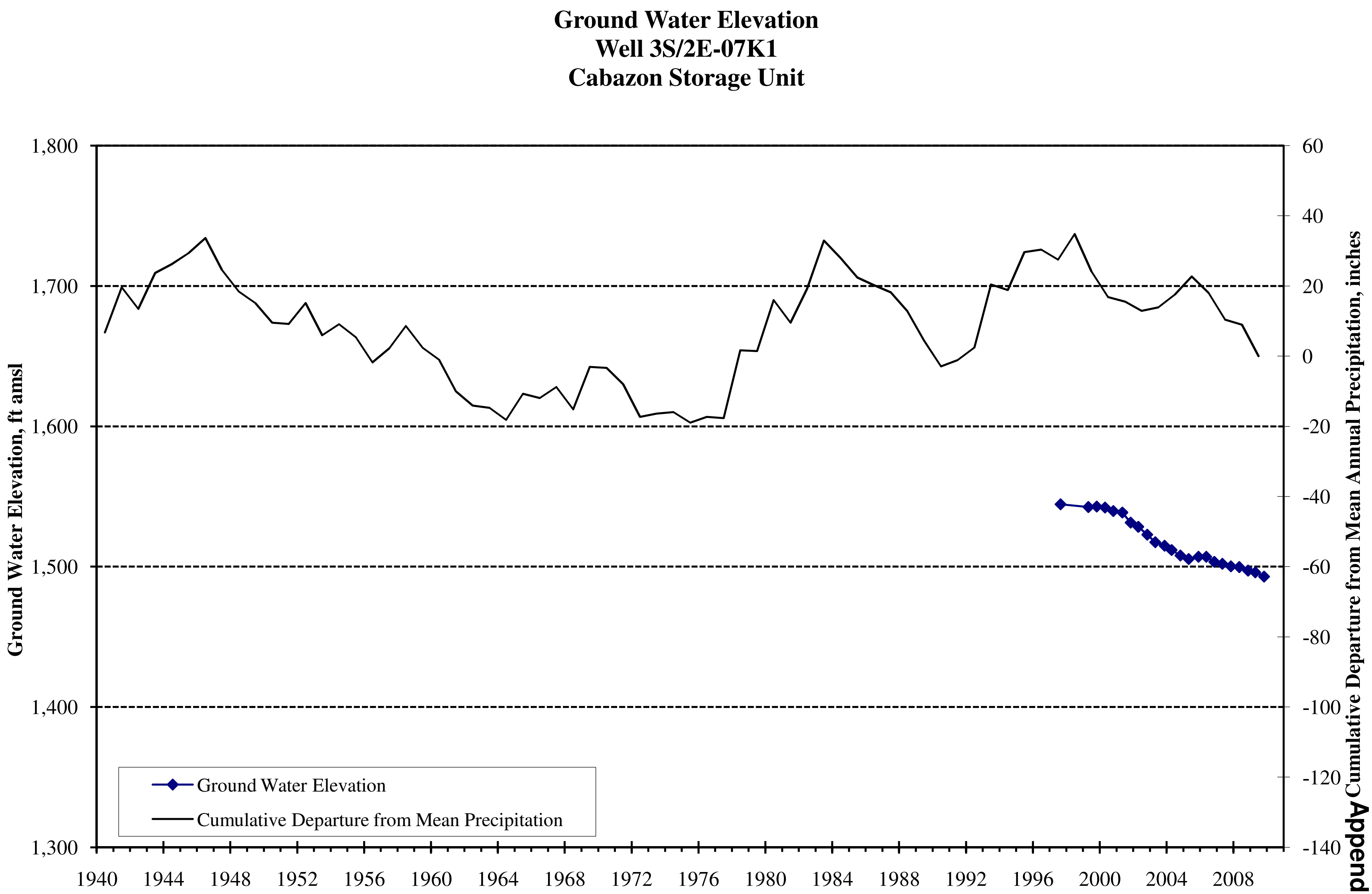
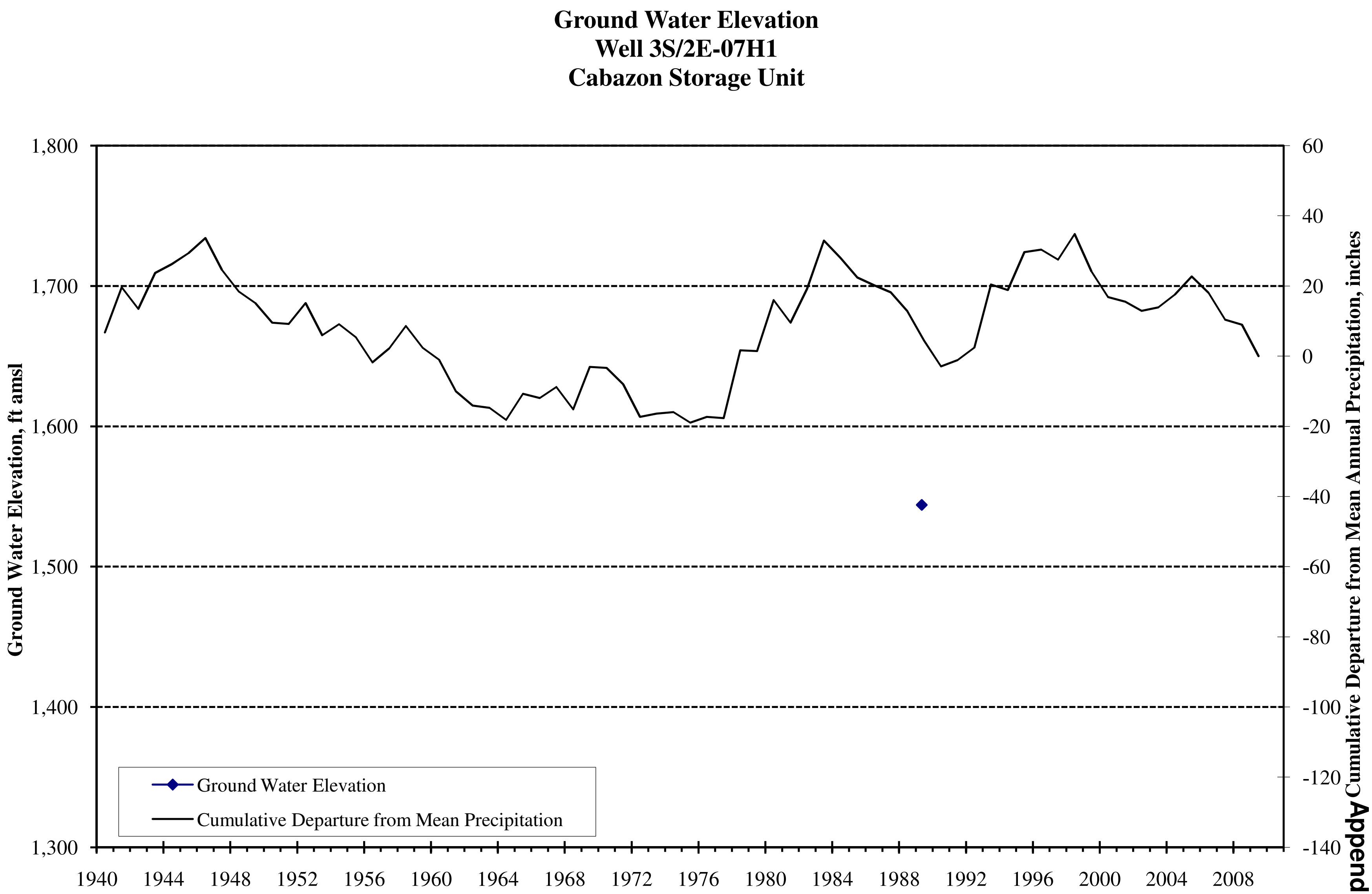

Ground Water Elevation
Well 3S/2E-07P1
Cabazon Storage Unit
Ground Water Elevation, ft amsl
1,800
1,700
1,600
1,500
1,400
1,300
Cumulative Departure from Mean Annual Precipitation, inches
60
40
20
0
-20
-40
-60
-80
-100
-120
-140
1940
1944
1948
1952
1956
1960
1964
1968
1972
1976
1980
1984
1988
1992
1996
2000
2004
2008
Ground Water Elevation
Cumulative Departure from Mean Precipitation

Appendix B

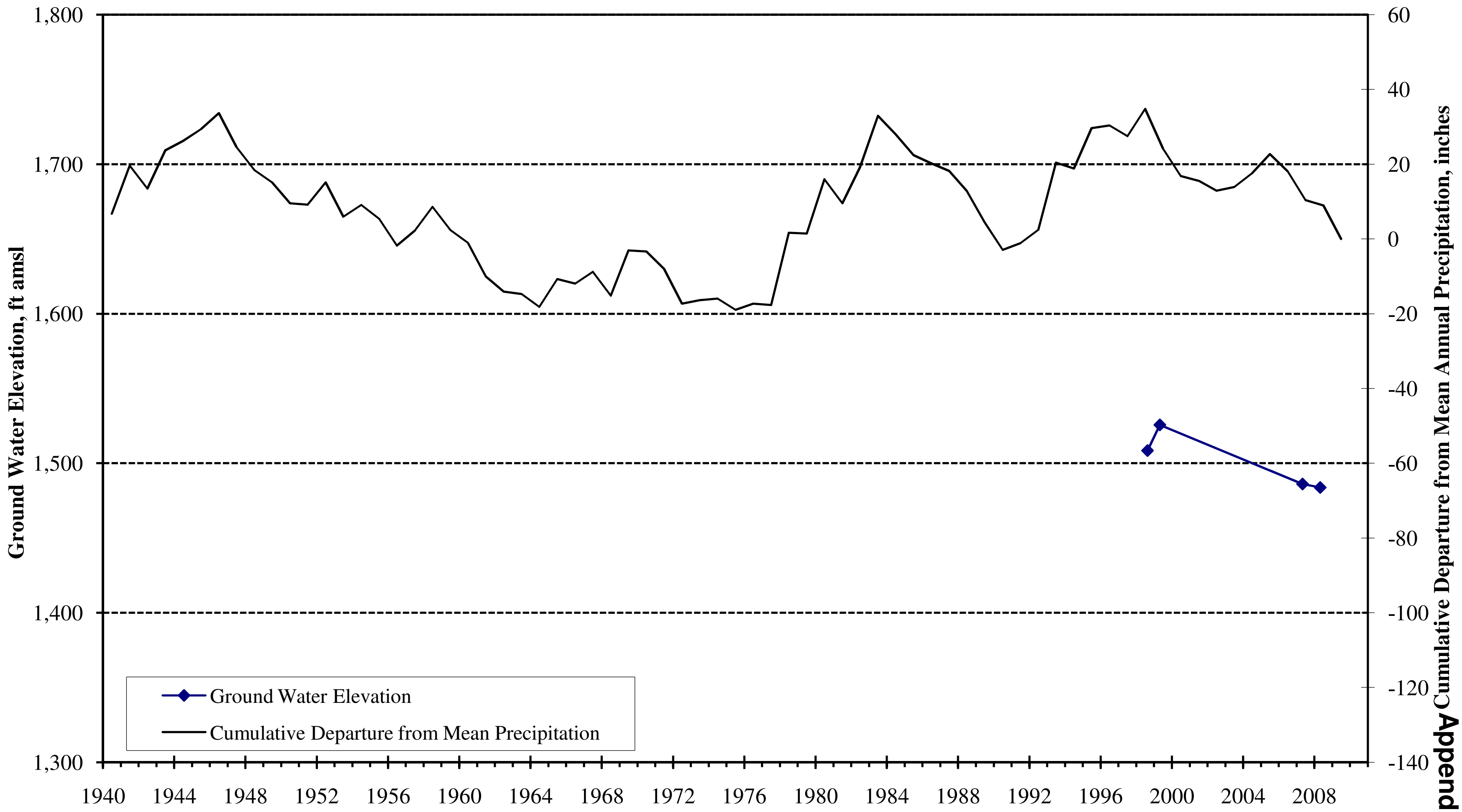

Ground Water Elevation
Well 3S/2E-07K1
Cabazon Storage Unit
Ground Water Elevation, ft amsl
Cumulative Departure from Mean Annual Precipitation, inches
1,800
1,700
1,600
1,500
1,400
1,300
60
40
20
0
-20
-40
-60
-80
-100
-120
-140
1940
1944
1948
1952
1956
1960
1964
1968
1972
1976
1980
1984
1988
1992
1996
2000
2004
2008
Ground Water Elevation
Cumulative Departure from Mean Precipitation

Appendix B


Ground Water Elevation
Well 3S/2E-07H1
Cabazon Storage Unit
Ground Water Elevation, ft amsl
Cumulative Departure from Mean Annual Precipitation, inches
1,800
1,700
1,600
1,500
1,400
1,300
60
40
20
0
-20
-40
-60
-80
-100
-120
-140
1940
1944
1948
1952
1956
1960
1964
1968
1972
1976
1980
1984
1988
1992
1996
2000
2004
2008
Ground Water Elevation
Cumulative Departure from Mean Precipitation

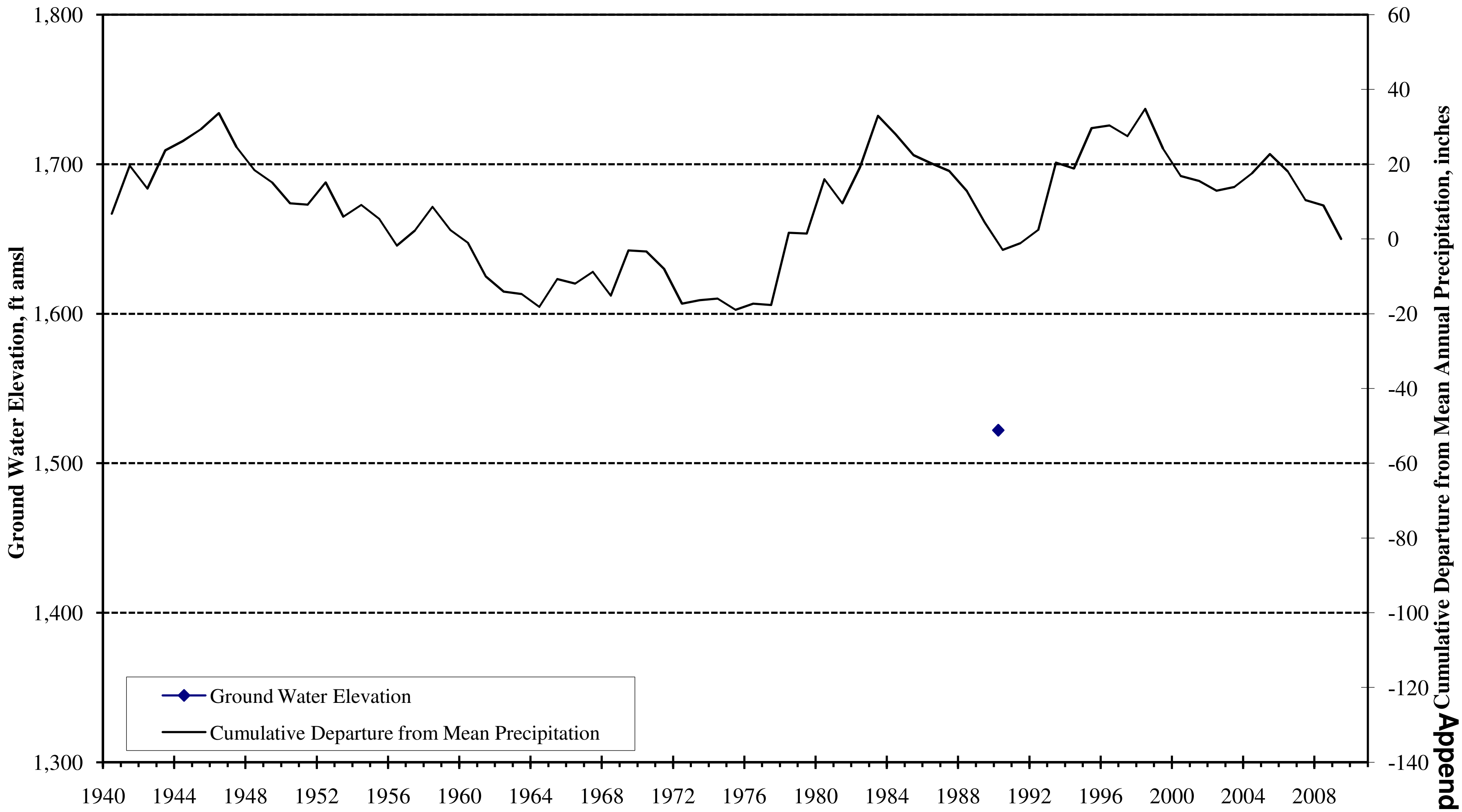
Appendix B

Ground Water Elevation
Well 3S/2E-07G2
Cabazon Storage Unit

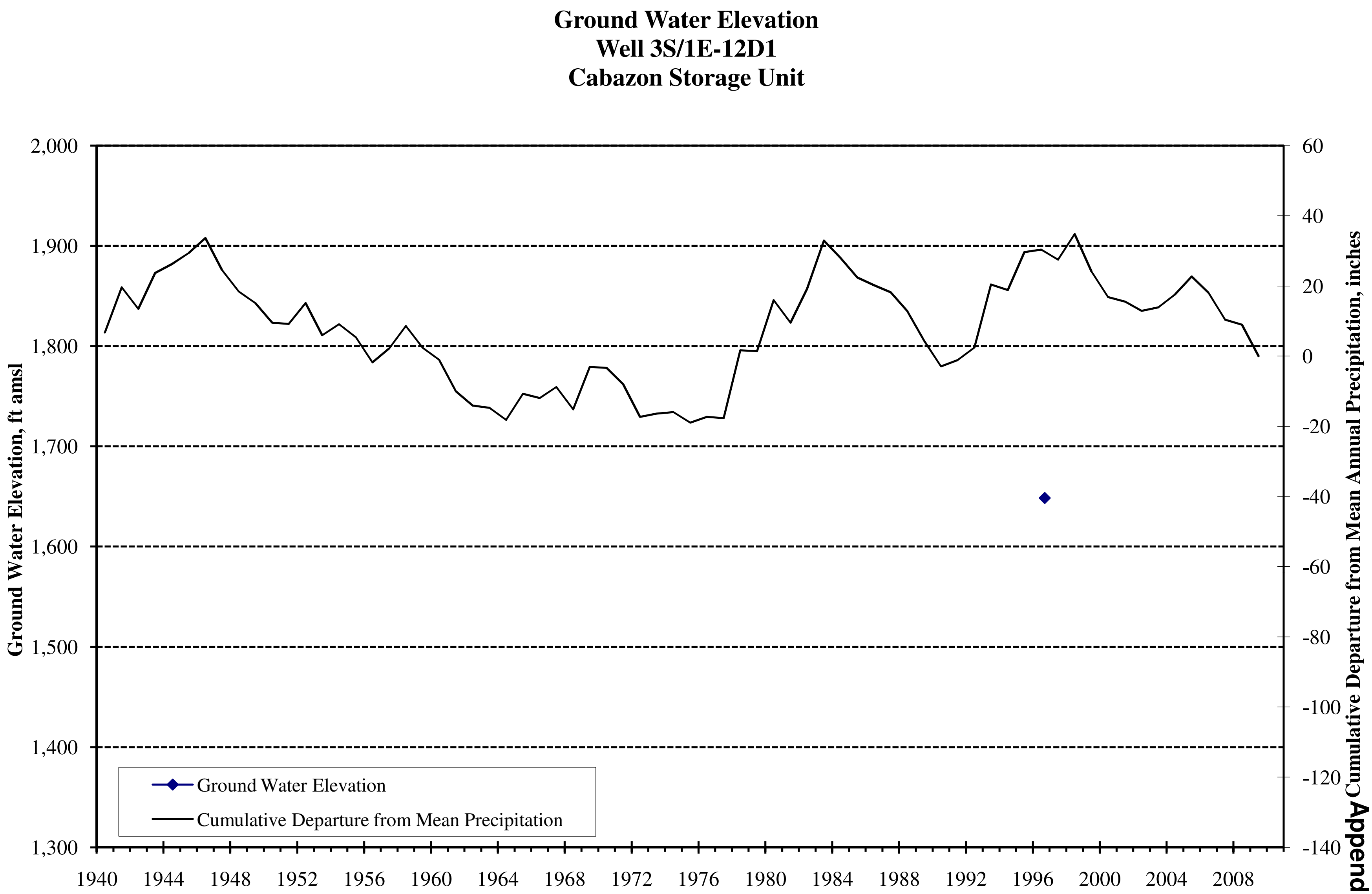


Appendix B

Ground Water Elevation
Well 3S/2E-07G1
Cabazon Storage Unit

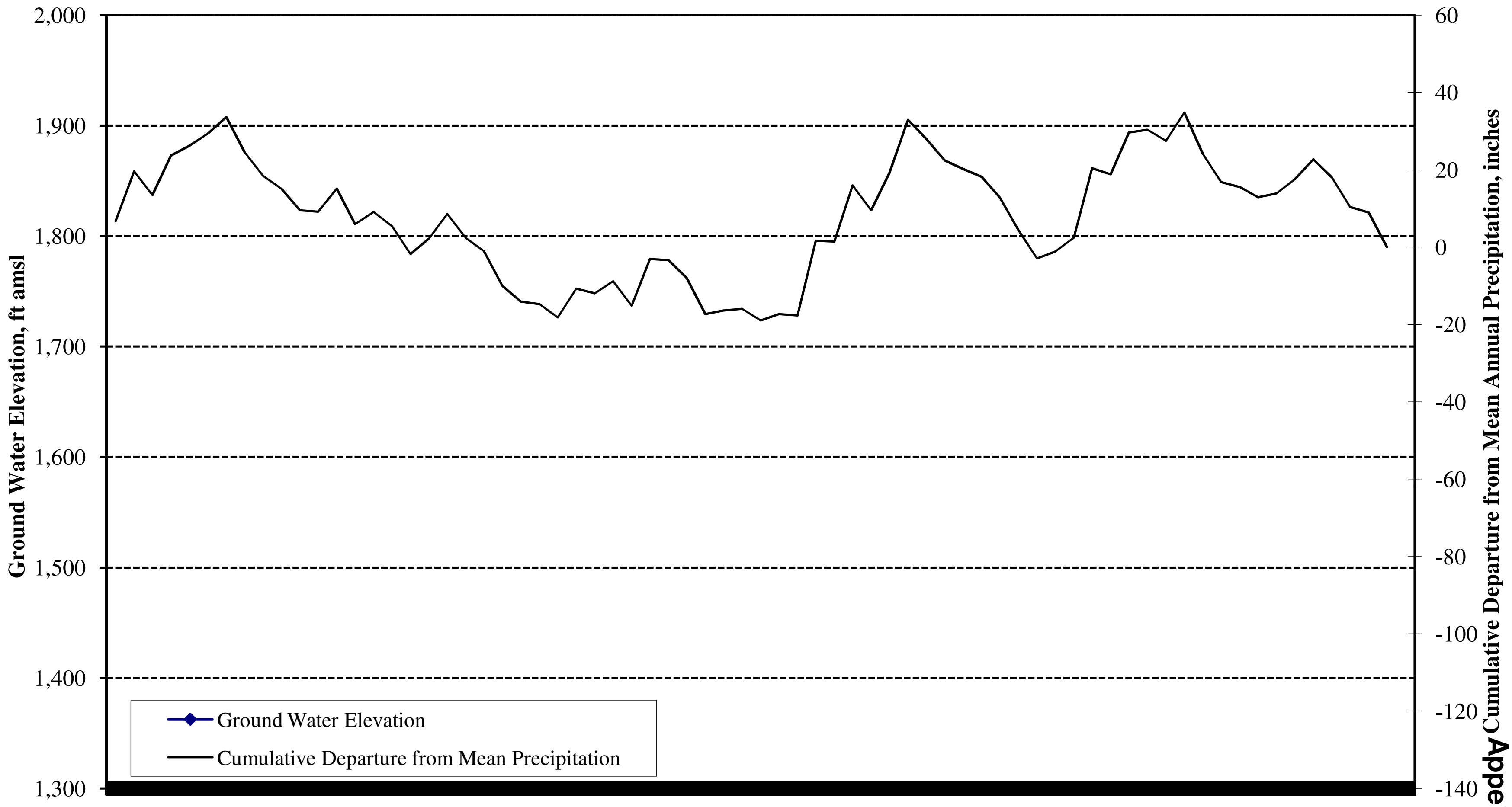


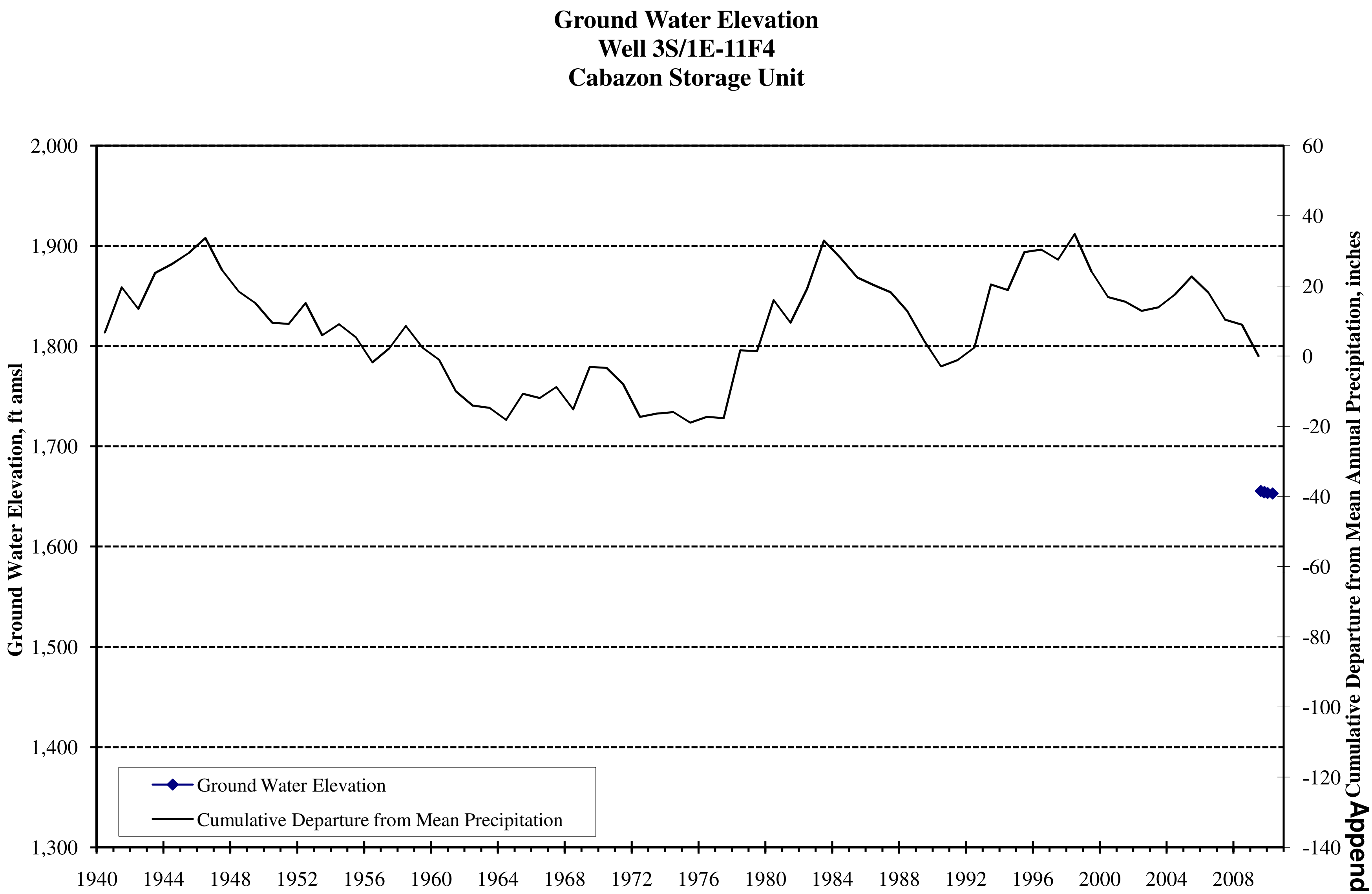
Appendix B


Ground Water Elevation
Well 3S/1E-12D1
Cabazon Storage Unit
2,000
1,900
1,800
1,700
1,600
1,500
1,400
1,300
Ground Water Elevation, ft amsl
60
40
20
0
-20
-40
-60
-80
-100
-120
-140
Cumulative Departure from Mean Annual Precipitation, inches
1940
1944
1948
1952
1956
1960
1964
1968
1972
1976
1980
1984
1988
1992
1996
2000
2004
2008
Ground Water Elevation
Cumulative Departure from Mean Precipitation

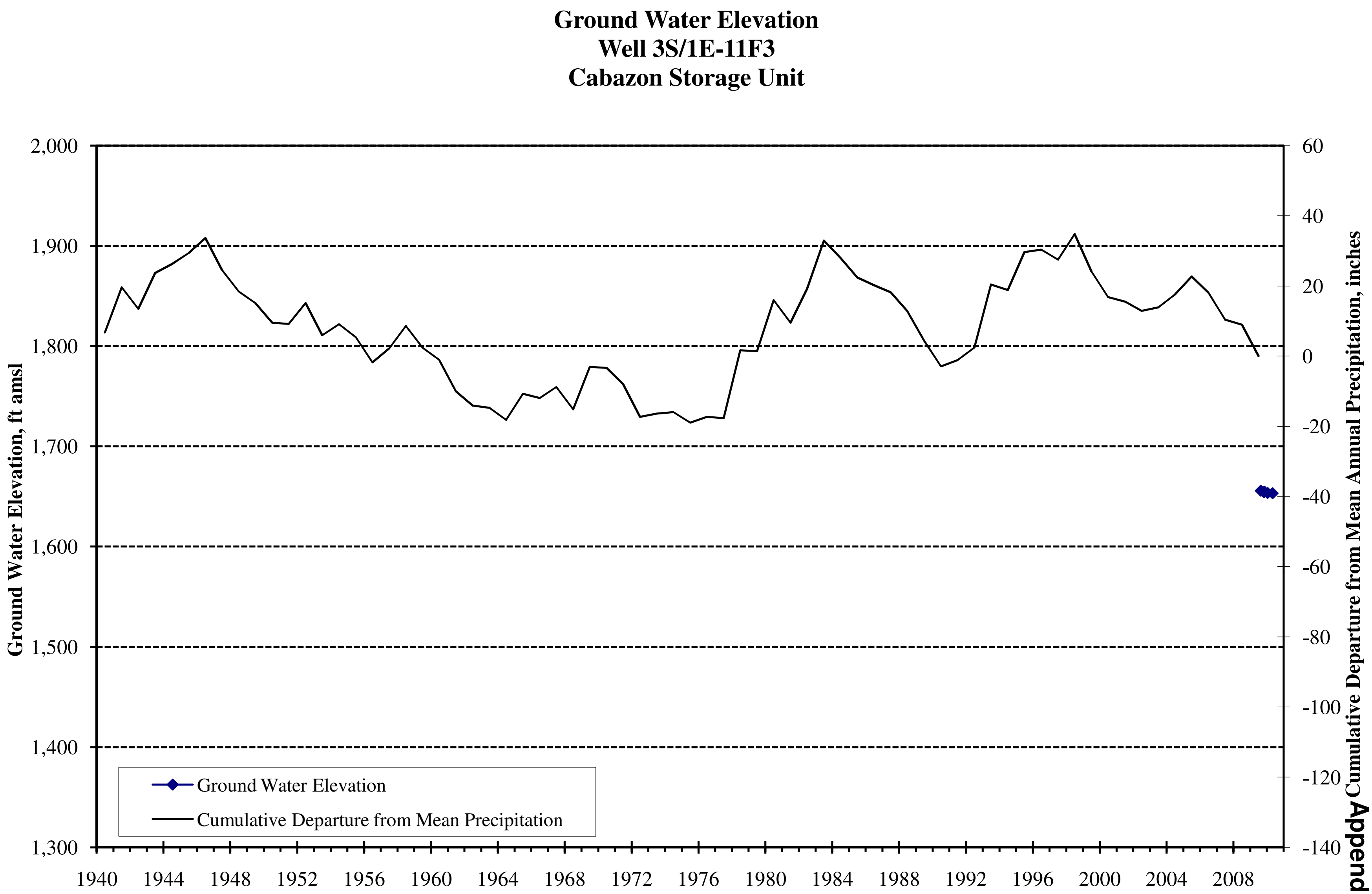
Appendix B

Ground Water Elevation
Well 3S/1E-12A1
Cabazon Storage Unit



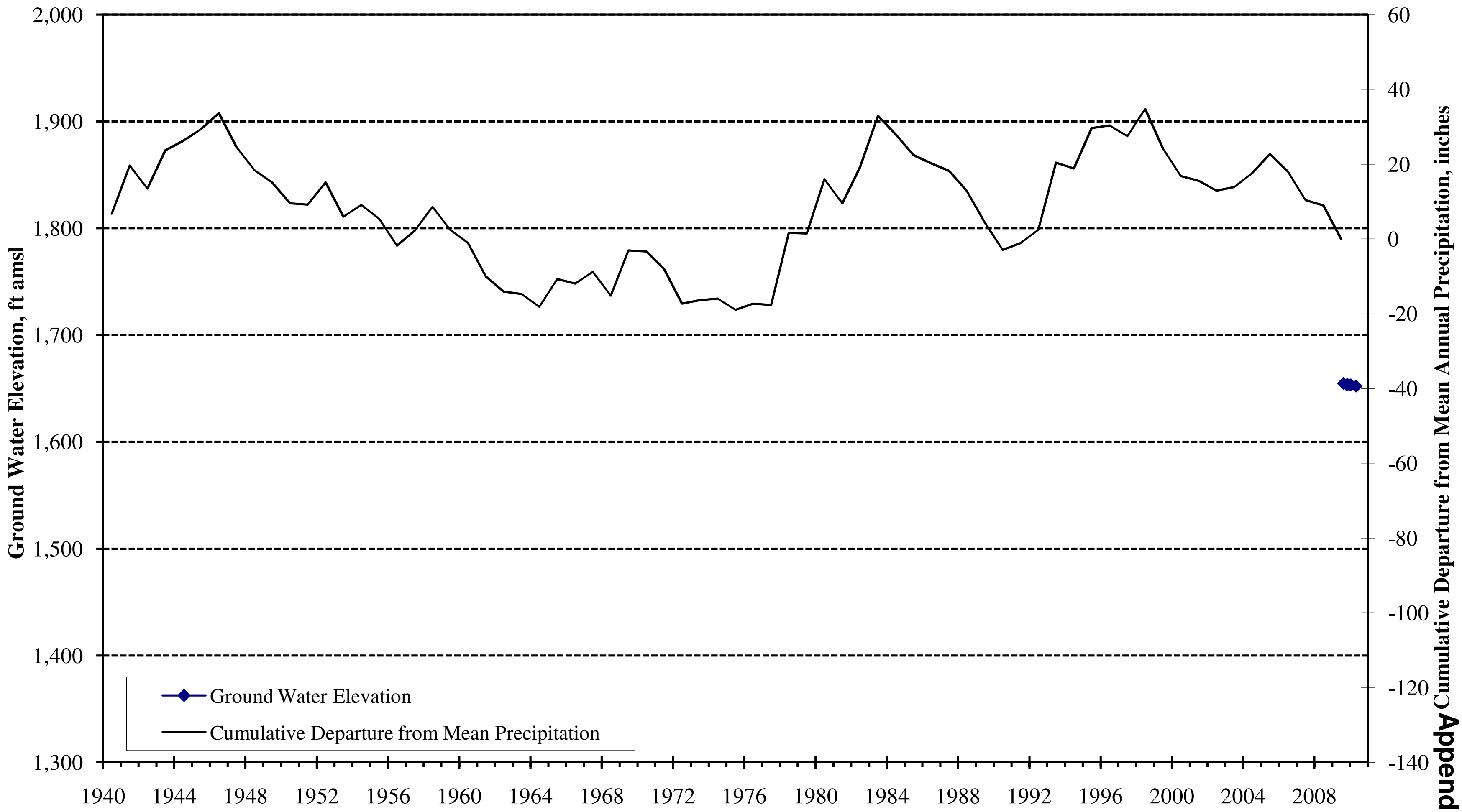

Ground Water Elevation
Well 3S/1E-11F4
Cabazon Storage Unit
Ground Water Elevation, ft amsl
2,000
1,900
1,800
1,700
1,600
1,500
1,400
1,300
Cumulative Departure from Mean Annual Precipitation, inches
60
40
20
0
-20
-40
-60
-80
-100
-120
-140
1940
1944
1948
1952
1956
1960
1964
1968
1972
1976
1980
1984
1988
1992
1996
2000
2004
2008
Ground Water Elevation
Cumulative Departure from Mean Precipitation

Appendix B


Ground Water Elevation
Well 3S/1E-11F3
Cabazon Storage Unit
Ground Water Elevation, ft amsl
Cumulative Departure from Mean Annual Precipitation, inches
2,000
1,900
1,800
1,700
1,600
1,500
1,400
1,300
60
40
20
0
-20
-40
-60
-80
-100
-120
-140
1940
1944
1948
1952
1956
1960
1964
1968
1972
1976
1980
1984
1988
1992
1996
2000
2004
2008
Ground Water Elevation
Cumulative Departure from Mean Precipitation

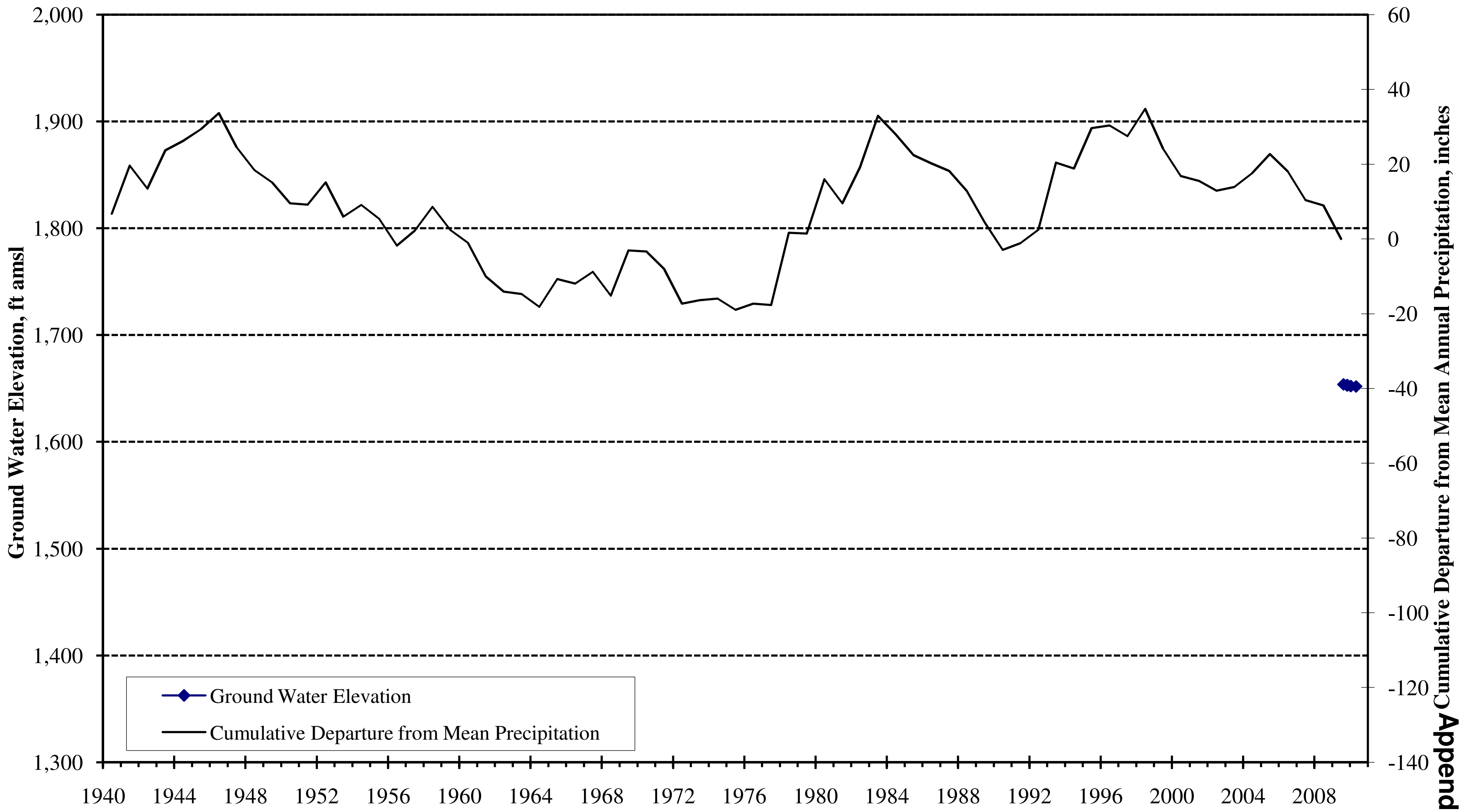
Appendix B

Ground Water Elevation
Well 3S/1E-11F2
Cabazon Storage Unit

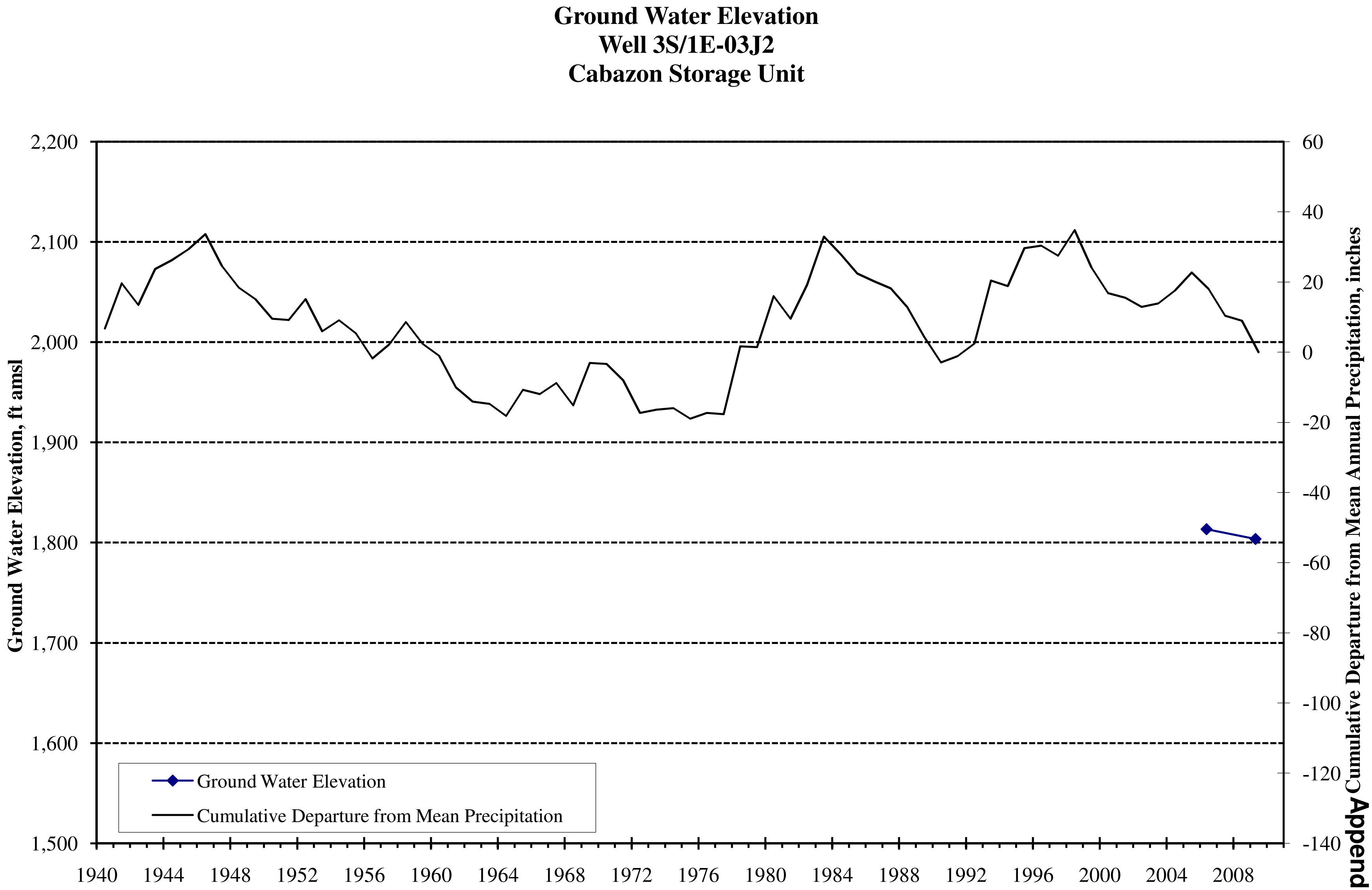


Appendix B

Ground Water Elevation
Well 3S/1E-11F1
Cabazon Storage Unit

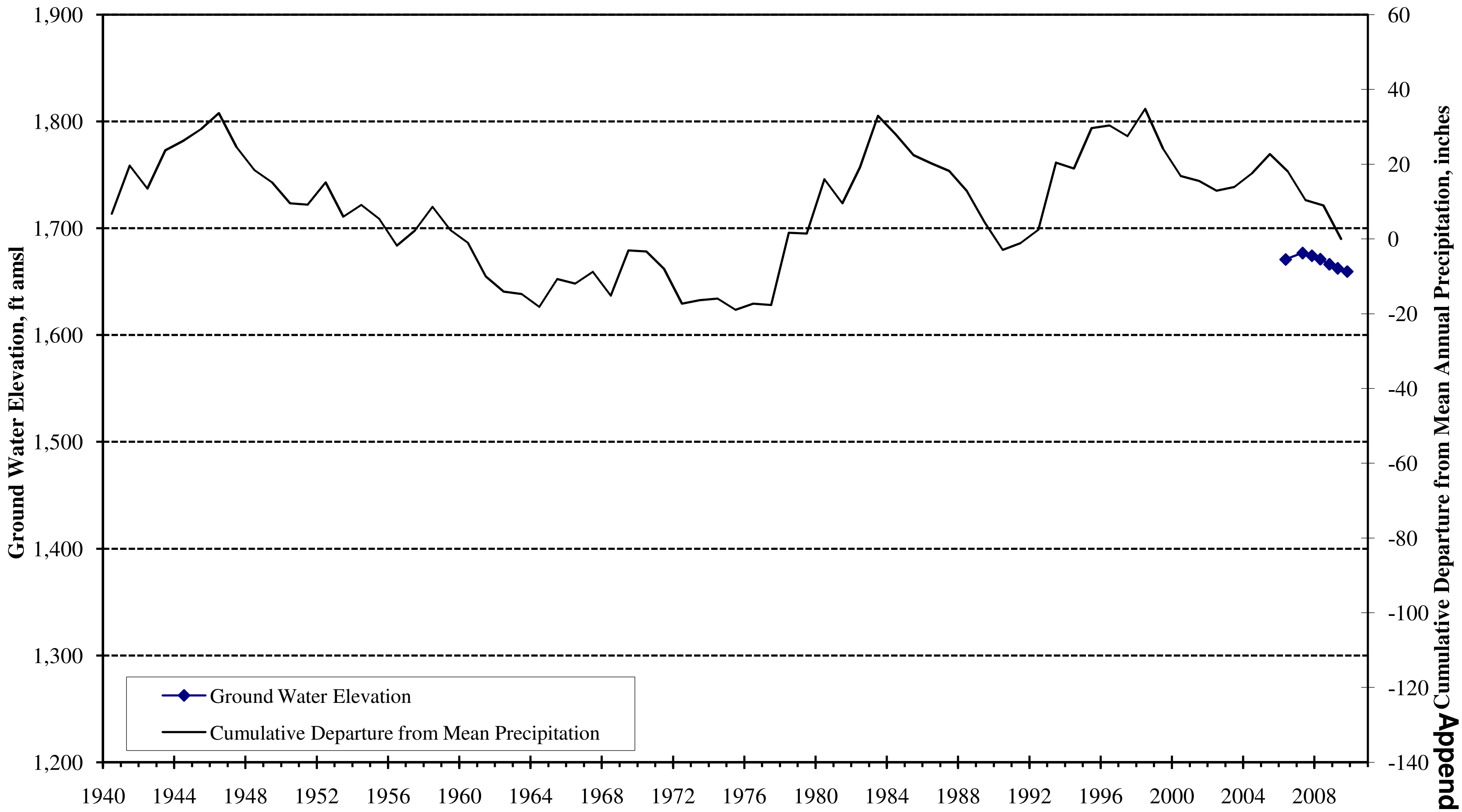


Appendix B


Ground Water Elevation
Well 3S/1E-03J2
Cabazon Storage Unit
Ground Water Elevation, ft amsl
Cumulative Departure from Mean Annual Precipitation, inches
2,200
2,100
2,000
1,900
1,800
1,700
1,600
1,500
60
40
20
0
-20
-40
-60
-80
-100
-120
-140
1940
1944
1948
1952
1956
1960
1964
1968
1972
1976
1980
1984
1988
1992
1996
2000
2004
2008
Ground Water Elevation
Cumulative Departure from Mean Precipitation

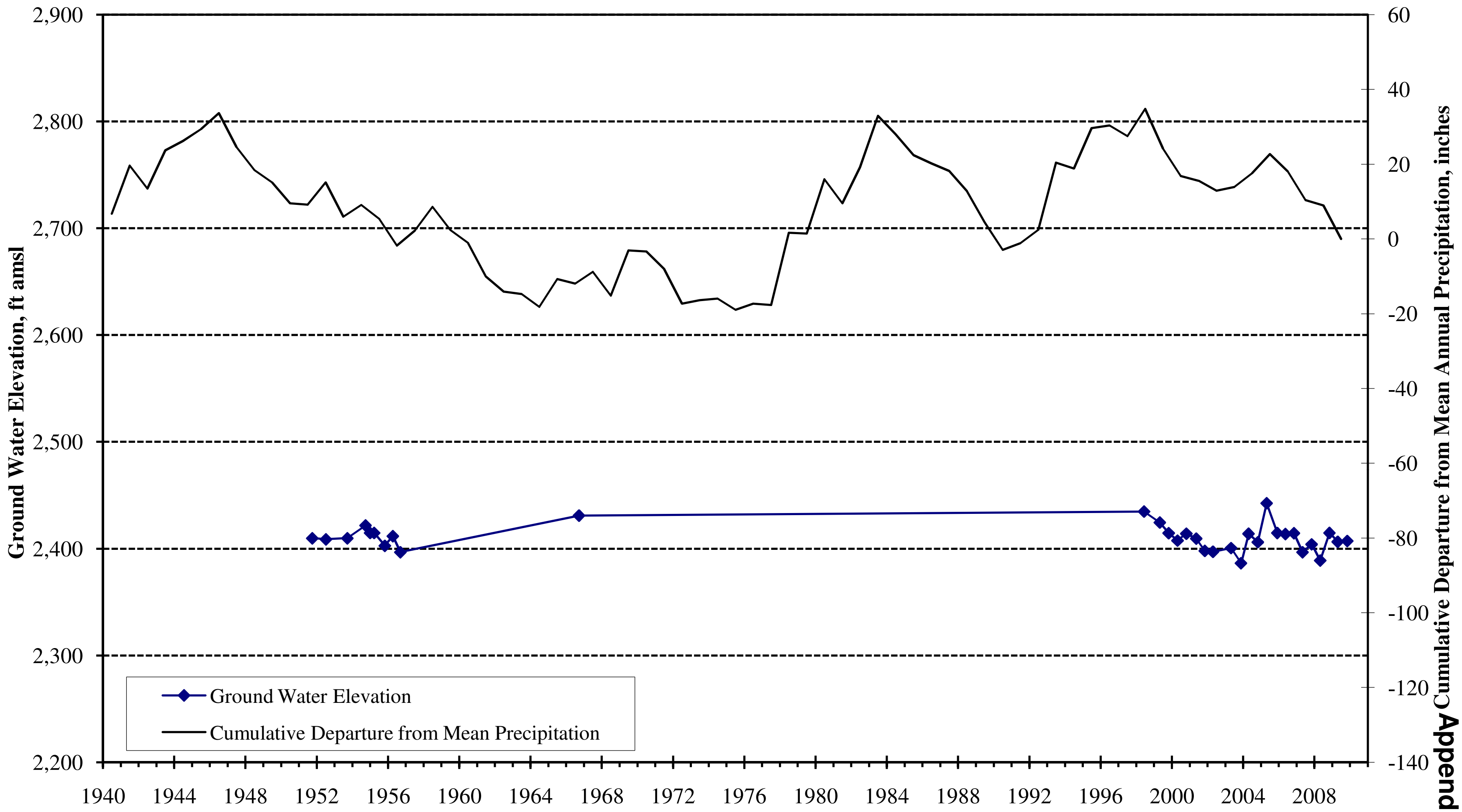
Appendix B

Ground Water Elevation
Well 3S/1E-03J1
Cabazon Storage Unit



Appendix B

Ground Water Elevation
Well 3S/1E-03C2
Cabazon Storage Unit



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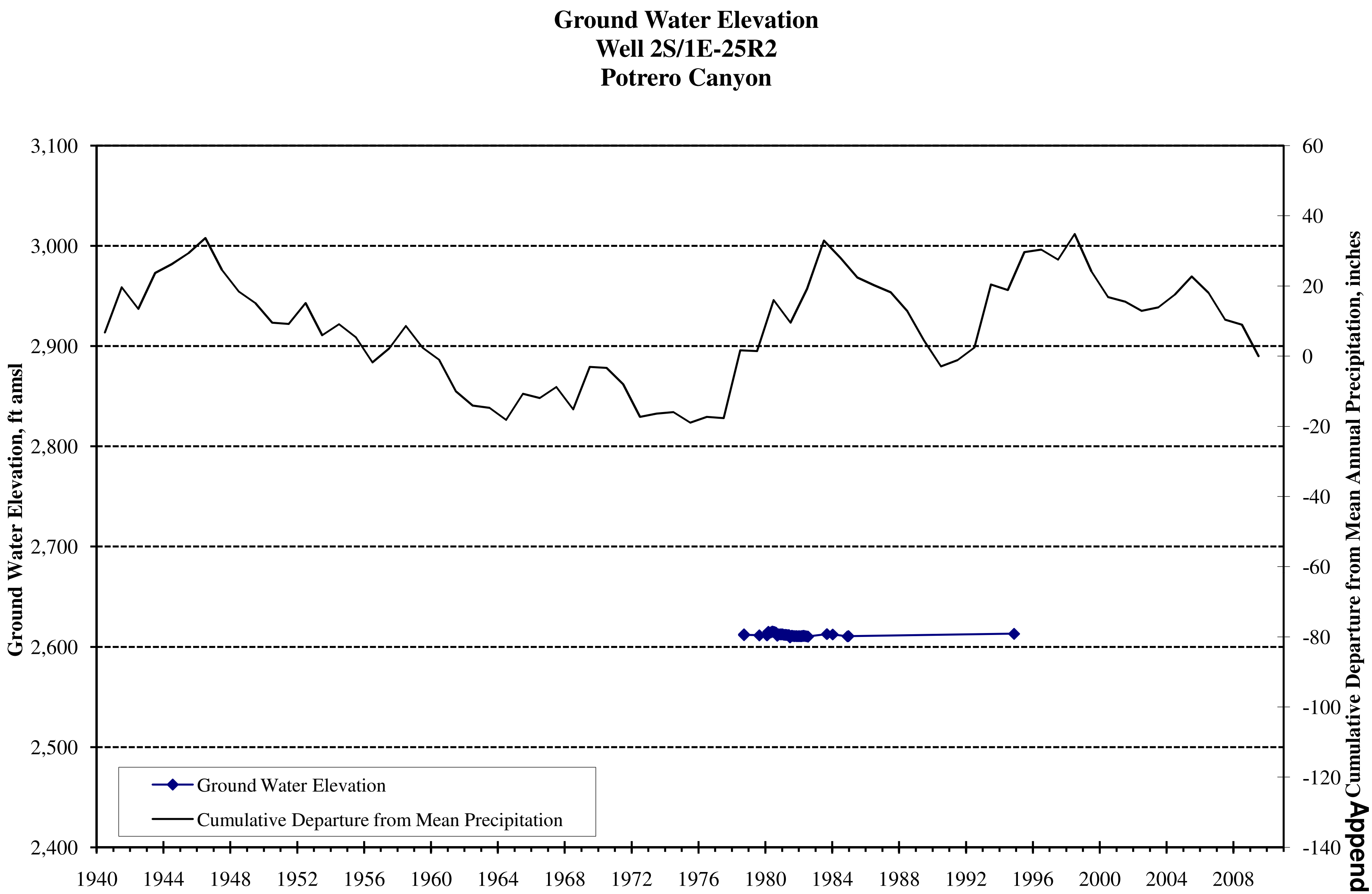
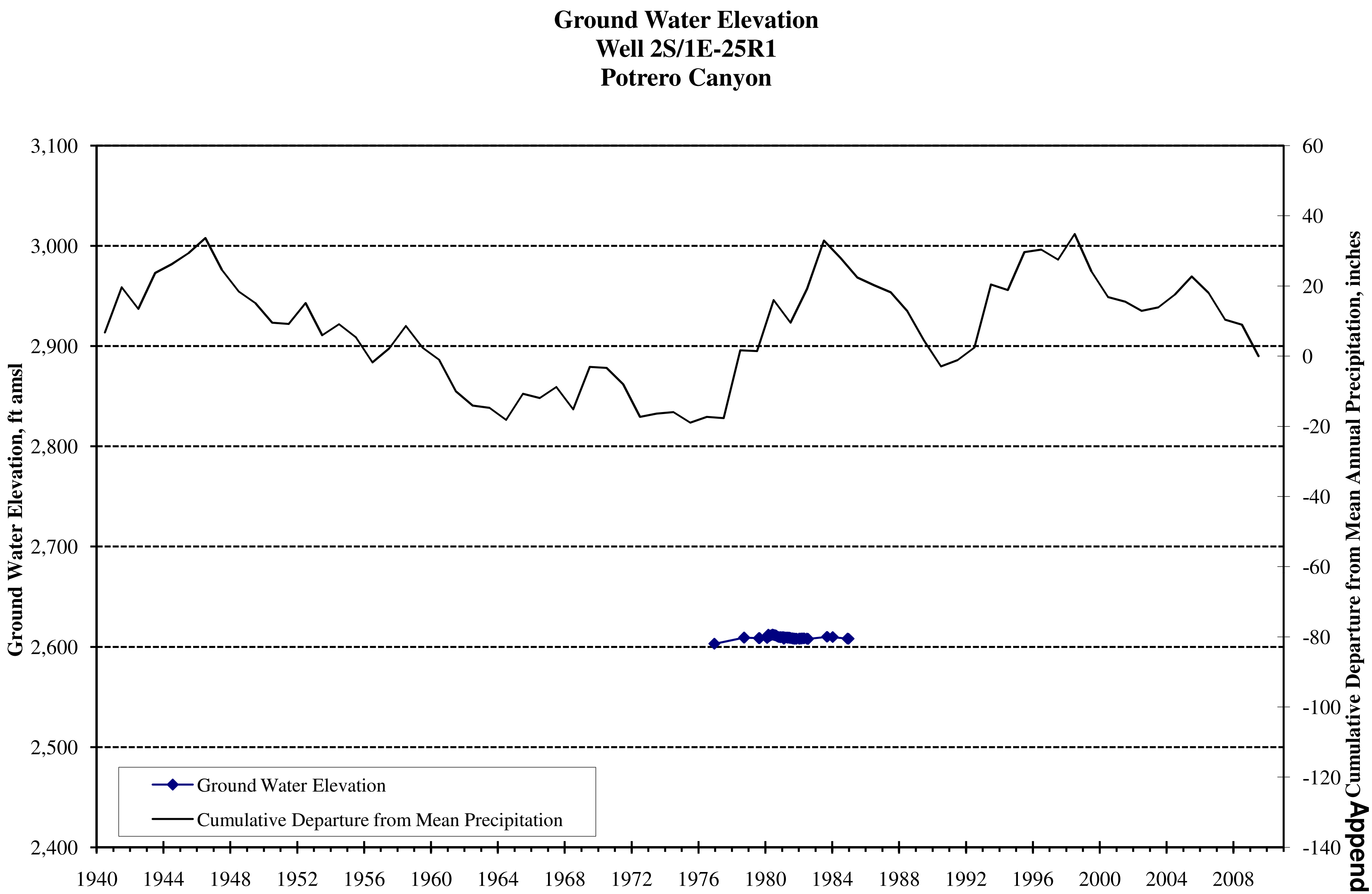
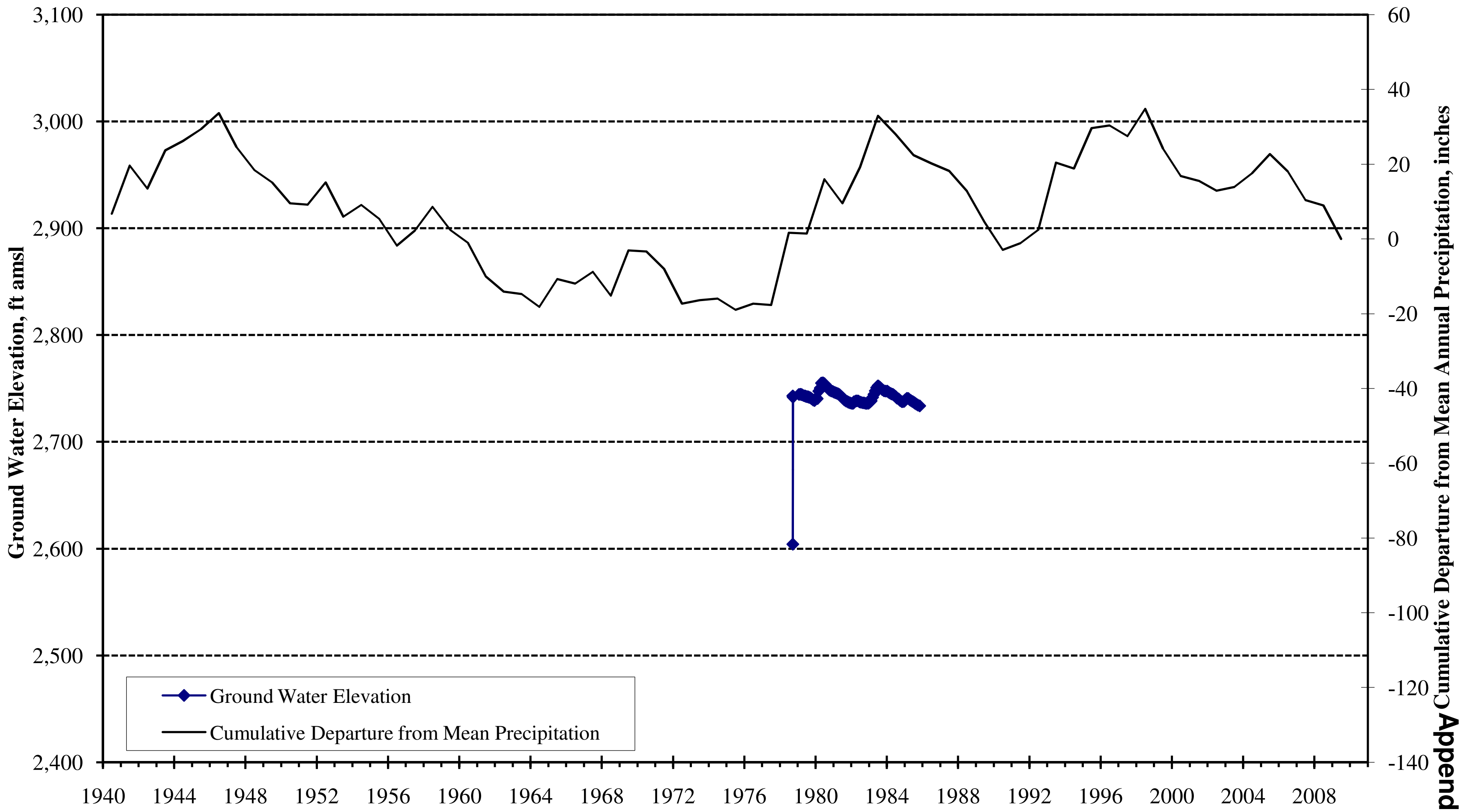

Ground Water Elevation
Well 2S/1E-25R2
Potrero Canyon
Ground Water Elevation, ft amsl
Cumulative Departure from Mean Annual Precipitation, inches
3,100
3,000
2,900
2,800
2,700
2,600
2,500
2,400
60
40
20
0
-20
-40
-60
-80
-100
-120
-140
1940
1944
1948
1952
1956
1960
1964
1968
1972
1976
1980
1984
1988
1992
1996
2000
2004
2008
Ground Water Elevation
Cumulative Departure from Mean Precipitation

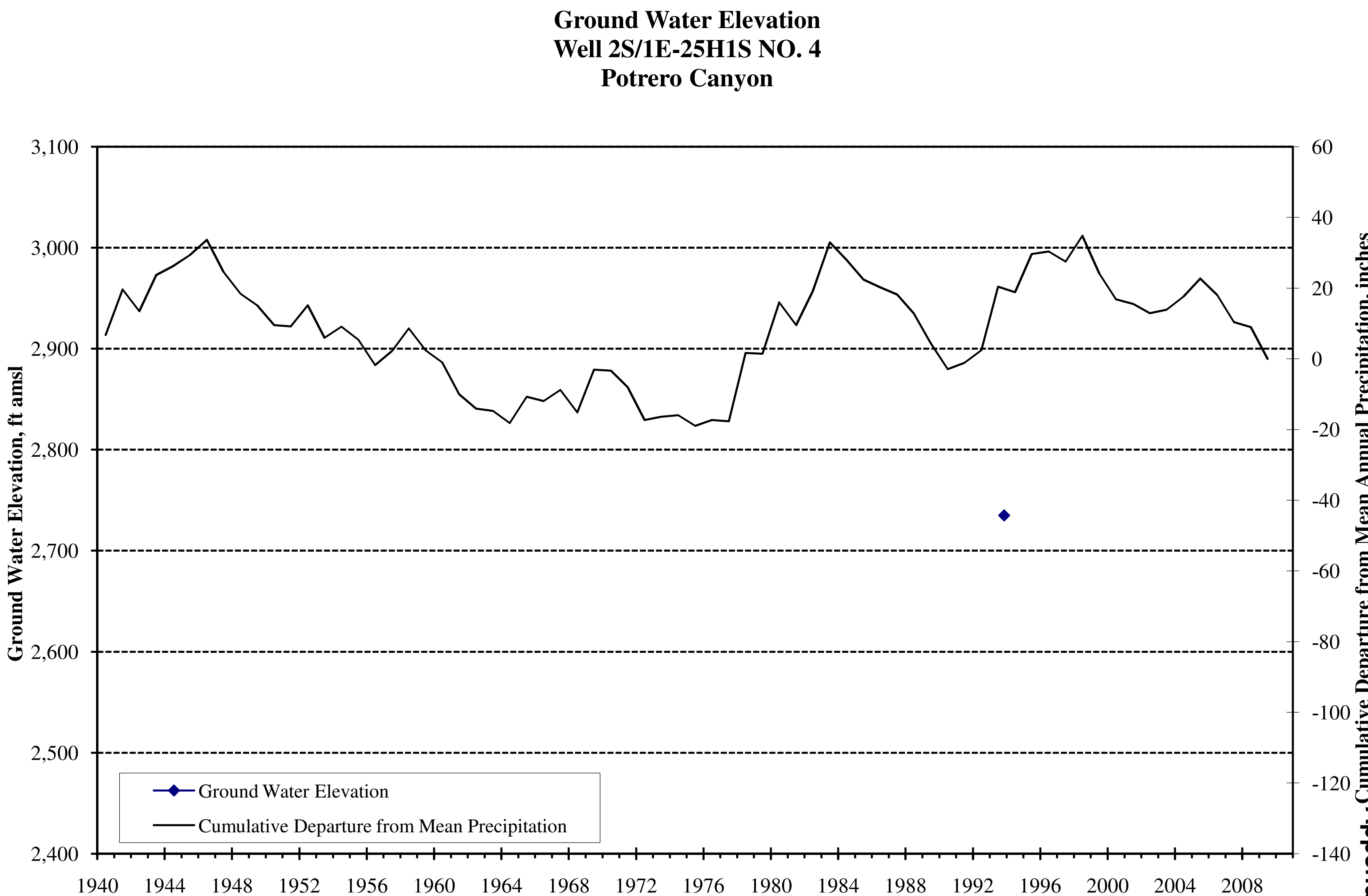

Ground Water Elevation
Well 2S/1E-25R1
Potrero Canyon
Ground Water Elevation, ft amsl
Cumulative Departure from Mean Annual Precipitation, inches
3,100
3,000
2,900
2,800
2,700
2,600
2,500
2,400
60
40
20
0
-20
-40
-60
-80
-100
-120
-140
1940
1944
1948
1952
1956
1960
1964
1968
1972
1976
1980
1984
1988
1992
1996
2000
2004
2008
Ground Water Elevation
Cumulative Departure from Mean Precipitation

Appendix B

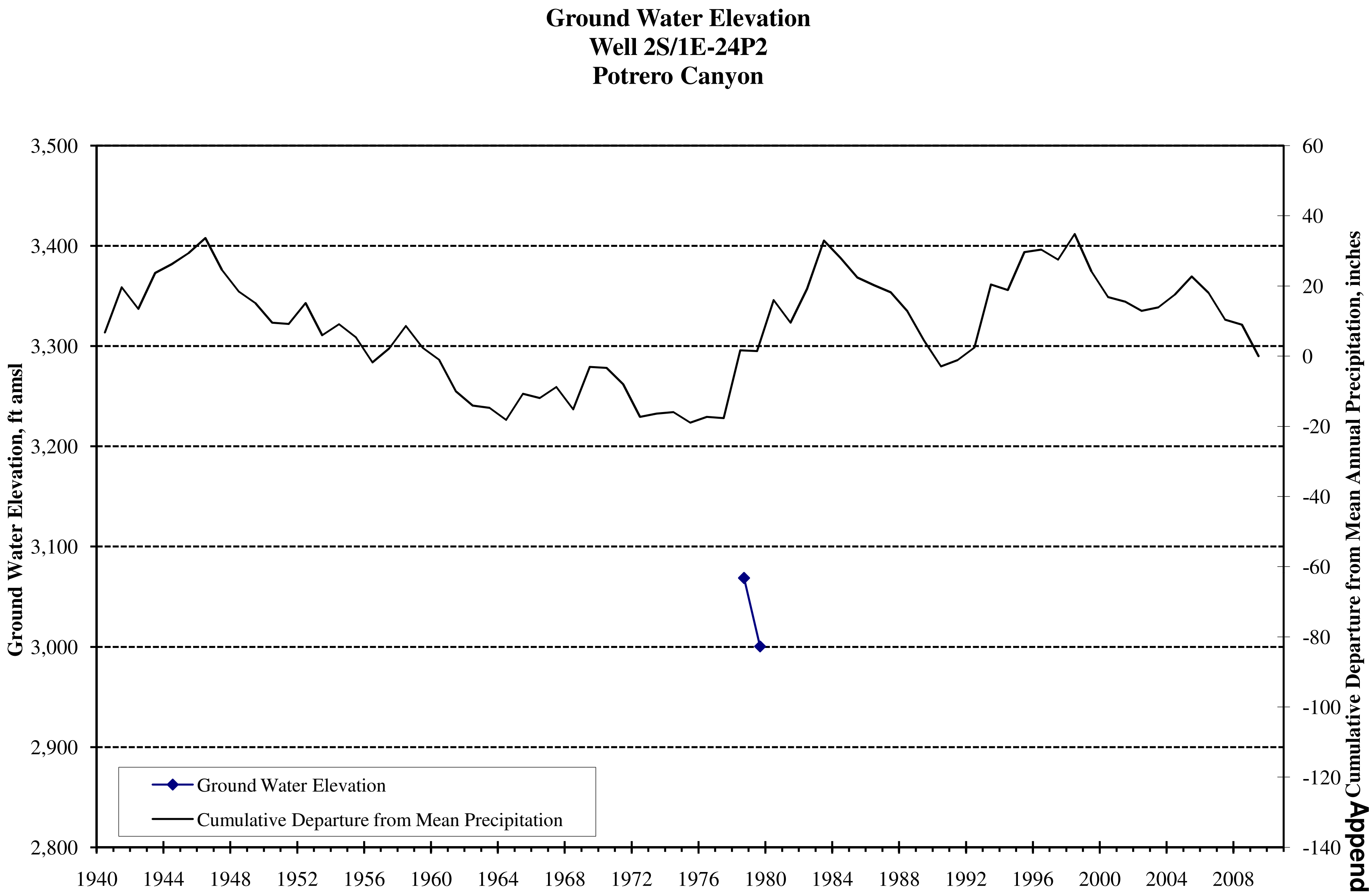
Ground Water Elevation
Well 2S/1E-25J1
Potrero Canyon



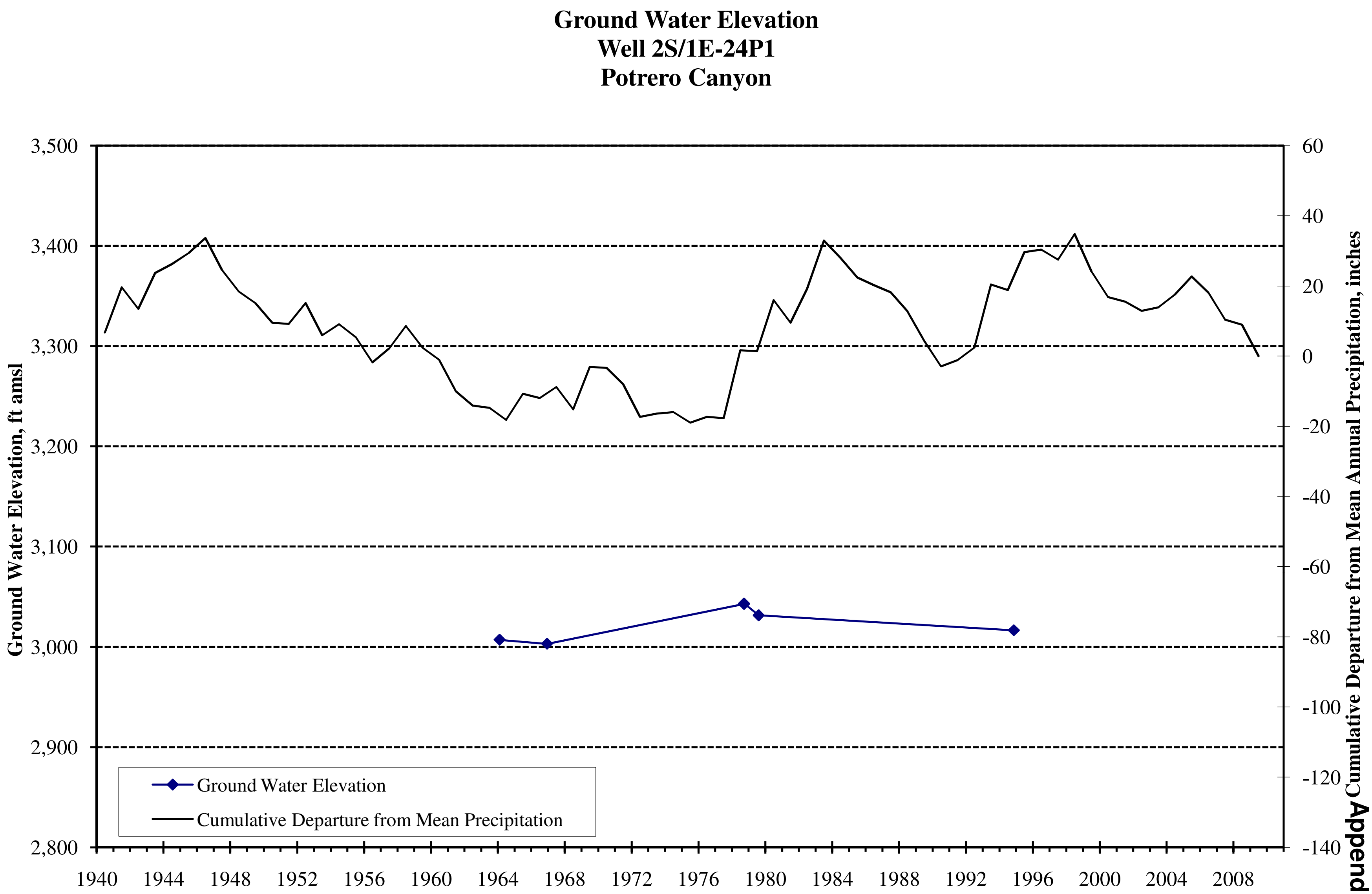
Appendix B


Ground Water Elevation
Well 2S/1E-25H1S NO. 4
Potrero Canyon
Ground Water Elevation, ft amsl
Cumulative Departure from Mean Annual Precipitation, inches
3,100
3,000
2,900
2,800
2,700
2,600
2,500
2,400
60
40
20
0
-20
-40
-60
-80
-100
-120
-140
1940
1944
1948
1952
1956
1960
1964
1968
1972
1976
1980
1984
1988
1992
1996
2000
2004
2008
Ground Water Elevation
Cumulative Departure from Mean Precipitation

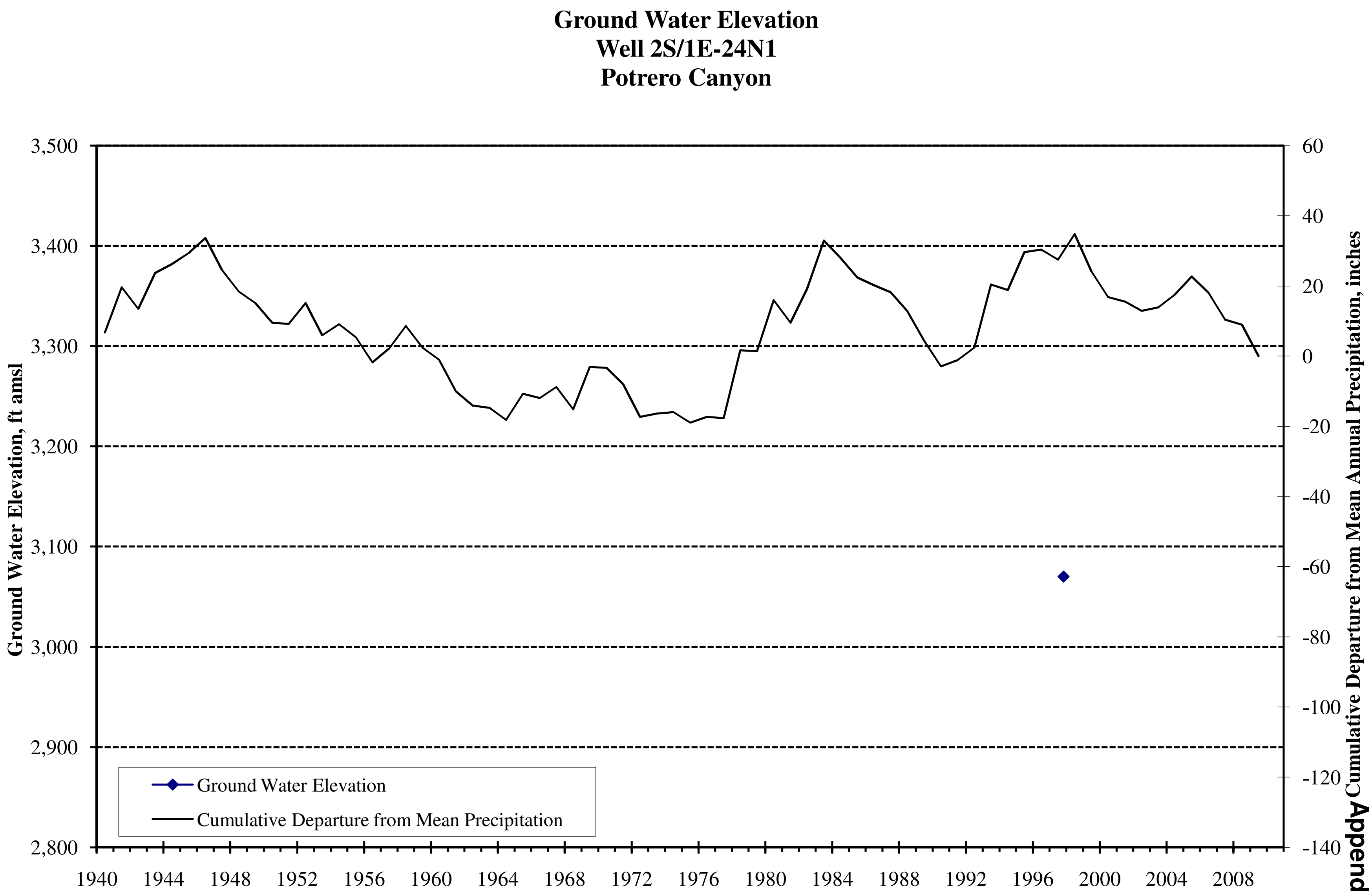
Appendix B


Ground Water Elevation
Well 2S/1E-24P2
Potrero Canyon
Ground Water Elevation, ft amsl
Cumulative Departure from Mean Annual Precipitation, inches
3,500
3,400
3,300
3,200
3,100
3,000
2,900
2,800
60
40
20
0
-20
-40
-60
-80
-100
-120
-140
1940
1944
1948
1952
1956
1960
1964
1968
1972
1976
1980
1984
1988
1992
1996
2000
2004
2008
Ground Water Elevation
Cumulative Departure from Mean Precipitation

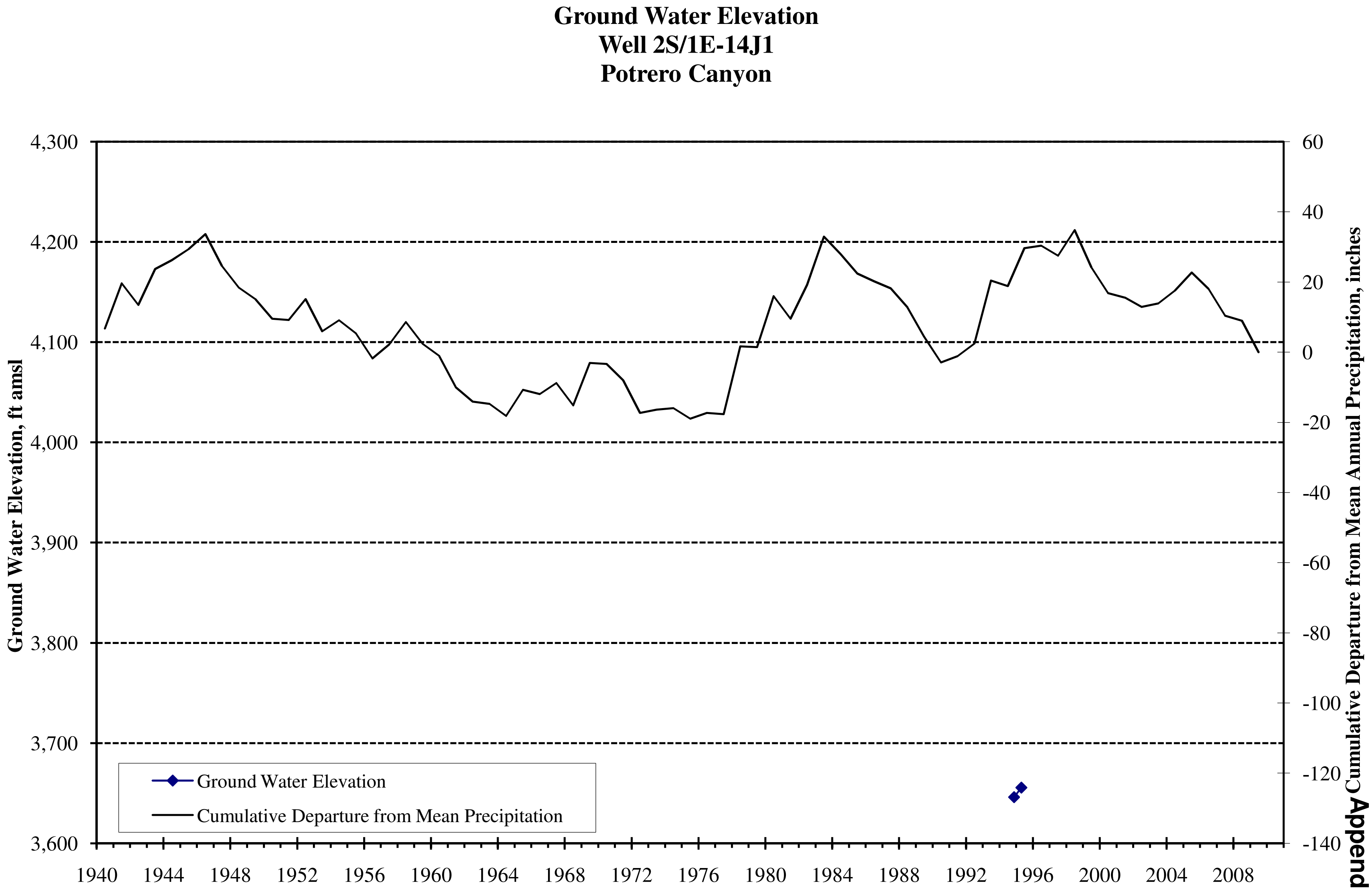
Appendix B


Ground Water Elevation
Well 2S/1E-24P1
Potrero Canyon
3,500
3,400
3,300
3,200
3,100
3,000
2,900
2,800
Ground Water Elevation, ft amsl
60
40
20
0
-20
-40
-60
-80
-100
-120
-140
Cumulative Departure from Mean Annual Precipitation, inches
1940
1944
1948
1952
1956
1960
1964
1968
1972
1976
1980
1984
1988
1992
1996
2000
2004
2008
Ground Water Elevation
Cumulative Departure from Mean Precipitation

Appendix B


Ground Water Elevation
Well 2S/1E-24N1
Potrero Canyon
Ground Water Elevation, ft amsl
3,500
3,400
3,300
3,200
3,100
3,000
2,900
2,800
Cumulative Departure from Mean Annual Precipitation, inches
60
40
20
0
-20
-40
-60
-80
-100
-120
-140
1940
1944
1948
1952
1956
1960
1964
1968
1972
1976
1980
1984
1988
1992
1996
2000
2004
2008
Ground Water Elevation
Cumulative Departure from Mean Precipitation

Appendix B


Ground Water Elevation
Well 2S/1E-14J1
Potrero Canyon
Ground Water Elevation, ft amsl
Cumulative Departure from Mean Annual Precipitation, inches
4,300
4,200
4,100
4,000
3,900
3,800
3,700
3,600
60
40
20
0
-20
-40
-60
-80
-100
-120
-140
1940
1944
1948
1952
1956
1960
1964
1968
1972
1976
1980
1984
1988
1992
1996
2000
2004
2008
Ground Water Elevation
Cumulative Departure from Mean Precipitation

Appendix B

APPENDIX C

Select Historical Water Quality Data

GEOSCIENCE

Select Historical Water Quality Constituents in the City of Banning Water Resource Area

Well Name	Date	Aluminum [µg/L] 50 µg/L[1]	Arsenic [µg/L] 6 µg/L[1]	Chloride [mg/L] 250 mg/L[2]	Color [units] 15 color units[2]	Fluoride [mg/L] 2 mg/L[2]	Iron [µg/L] 300 µg/L[2]	Manganese [mg/L] 0.05 mg/L[2]	Nitrate (as NO3) [mg/L] 45 mg/L[1]	TDS [mg/L] 500 mg/L[2]
City of Banning Well 01	27-Jun-05			2.4					3.3	190
	29-Jun-05			2.4					3.2	190
	30-Jun-05			2.4					3.9	210
	06-Dec-84		ND	4	ND	0.3	ND	ND	7	135
	30-Jan-94	170		113.49			130	3	6.6	626
	07-Mar-94	ND	ND	10	ND	0.4	ND	ND	2	165
	16-Feb-95			10				3	1.25	290
	26-Oct-95								32	
	05-Sep-96	0	0	3	ND	0.4	0	0	2.7	170
	13-Sep-96		96	14			180		5.2	216
	29-Sep-98			18					15.9	390
	02-Mar-99	0	0	2	ND	0.4	0	0	3	180
	02-Aug-00			26					8	310
	02-Oct-01		2	16.1					12.6	263
	01-Oct-02		ND	16.3					9.1	185
	29-Oct-02	52	0	5.7	ND	0.4	0	0	4	240
	19-Dec-02				ND	1.3				
	25-May-05								6.3	220
	05-Jan-06	ND	ND	2.4	ND	0.4	ND	ND	3.1	190
	20-Apr-06								3.3	
	10-Apr-07								3.2	
	28-Apr-08								3.9	
	27-Jan-09	ND	ND	2.4	ND	0.3	ND	ND	4.5	210
	03-Feb-09				ND	0.6				
City of Banning Well 02	17-Apr-84		ND	7	ND	0.5	ND	ND	3	175
	07-Mar-94	ND	ND	3	ND	0.4	ND	ND	3	170
	05-Sep-96	0	0	7	ND	0.5	0	0	6.2	230
	02-Mar-99	0	0	3	3	0.4	0	0	3	160
	29-Oct-02	0	0	14	ND	1.2	0	0	8	360
	25-May-05			2.6			150		5.6	190
	05-Jan-06	ND	ND	2.6	3	0.4	150	ND	2.8	190

Select Historical Water Quality Constituents in the City of Banning Water Resource Area

Well Name	Date	Aluminum [µg/L] 50 µg/L[1]	Arsenic [µg/L] 6 µg/L[1]	Chloride [mg/L] 250 mg/L[2]	Color [units] 15 color units[2]	Fluoride [mg/L] 2 mg/L[2]	Iron [µg/L] 300 µg/L[2]	Manganese [mg/L] 0.05 mg/L[2]	Nitrate (as NO3) [mg/L] 45 mg/L[1]	TDS [mg/L] 500 mg/L[2]
City of Banning Well 02 cont.	20-Apr-06								6.5	
	17-Apr-07			2.6			150		3.5	190
	28-Apr-08			2.8					6.9	200
	04-Feb-09	ND	ND	2.8	ND	0.5	ND	ND	4.2	200
City of Banning Well 03	06-Dec-84		ND	12	ND	0.6	ND	ND	8	225
	07-Mar-94	ND	ND	2	ND	0.4	130	ND	1	170
	05-Sep-96	0	0	10	ND	0.4	0	0	6.2	260
	02-Mar-99	0	0	3	ND	0.4	0	0	2	150
	19-Dec-02	0	0	15			0	0	9	310
	01-Jan-05			2.3						180
	25-May-05								5.5	190
	05-Jan-06	ND	ND	2.3			ND	ND	2.7	180
	20-Apr-06								7.3	
	10-Apr-07			2.3			150		5.3	180
	01-Jan-08			3.8						170
	28-Apr-08								7.5	
	03-Feb-09	ND	ND	3.8			ND	ND	4.8	170
	05-May-09								5.3	
City of Banning Well 04	13-Jan-84		ND	5	ND	0.4	ND	ND	ND	150
	06-Dec-84		ND	9	ND	0.4	ND	ND	1	160
	09-Mar-94	ND	ND	3	3	0.4	410	ND	2	165
	03-Mar-99	0	0	2	ND	0.3	0	0	ND	180
	25-May-05	ND	ND	2.1	ND	0.4	ND	ND	3.6	180
	11-Jan-06	ND	ND	2.7	ND	0.4	ND	ND	2.8	190
	20-Apr-06								3	
	17-Apr-07			2.7					2.5	
	28-Apr-08								3.6	
	25-Feb-09	ND	ND	2.2		0.4	ND	ND	2.8	180
	01-Jun-09				ND					
City of Banning Well 05	06-Dec-84		ND	7	5	0.5	530	ND	1	165
	10-Mar-94	ND	ND	2	ND	0.3	ND	ND	ND	160
	26-Oct-95								21	
	05-Sep-96	0	0	3	ND	0.3	0	0	2.2	180
	02-Mar-99	0	0	3	ND	0.4	0	0	2	180
	01-Jul-03	0	0	2.7	ND	0.4	0	0		180
	01-Jan-05			2.7			160			
	25-May-05								3.1	170
	11-Jan-06	ND	ND	2.7	3	0.3	160	ND	2.8	190

Select Historical Water Quality Constituents in the City of Banning Water Resource Area

Well Name	Date	Aluminum [µg/L] 50 µg/L[1]	Arsenic [µg/L] 6 µg/L[1]	Chloride [mg/L] 250 mg/L[2]	Color [units] 15 color units[2]	Fluoride [mg/L] 2 mg/L[2]	Iron [µg/L] 300 µg/L[2]	Manganese [mg/L] 0.05 mg/L[2]	Nitrate (as NO3) [mg/L] 45 mg/L[1]	TDS [mg/L] 500 mg/L[2]
City of Banning Well 05 cont.	01-Jan-07			2.7			160			190
	29-Jan-07								2.4	
	29-Jan-08								5.4	
	03-Mar-09	ND	ND	3	ND	0.4	ND	ND	5.5	180
City of Banning Well 06 - DESTROYED	08-Jan-90	200	ND	4	ND	0.4	920	10	16	185
	08-Mar-94	ND	ND	5	ND	0.3	ND	ND	13	210
City of Banning Well 07	06-Dec-84		ND	5	ND	0.4	ND	ND	ND	160
	07-Mar-94	ND	ND	3	ND	0.4	ND	ND	1	175
	05-Sep-96	0	0	2	ND	0.3	0	0	ND	160
	02-Mar-99	0	0	2	ND	0.4	0	0	ND	170
	06-Nov-02	0	0	3.5	ND	0.4	0	0	ND	220
	25-May-05								4.5	220
	09-Jan-06	ND	ND	2.6	ND	0.3	ND	ND	1.8	200
	20-Apr-06								1.9	
	10-Apr-07			2.6					1.4	200
	21-Apr-08								2.3	
	21-Jan-09	ND	ND	1.8	ND	0.4	ND	ND	1.6	230
	19-May-09								1.2	
City of Banning Well 08	06-Dec-84		ND	5	ND	0.5	ND	ND	1	170
	02-Mar-90	ND	ND	2	ND	0.3	730	ND	ND	205
	07-Mar-94	ND	ND	3	ND	0.4	ND	ND	1	185
	05-Sep-96	0	0	3	ND	0.4	0	0	2.2	170
	02-Mar-99	0	0	4	ND	0.4	0	0	ND	160
	19-Dec-02	140	0	3.4	5	0.4	580	0	ND	200
	01-Jan-05			3			180		1.8	290
	25-May-05								2.5	220
	10-Jan-06	ND	ND	3	3	0.4	180	ND	2.2	170
	20-Apr-06								1.8	
	17-Apr-07			3			180		1.5	170
	21-Apr-08								1.7	
	13-Jan-09	ND	ND	4.1	ND	0.4	ND	ND	2.5	170
	26-May-09								ND	
City of Banning Well 09	08-Jan-90	ND	ND	2	ND	0.4	260	ND	ND	210
	08-Mar-94	ND	ND	2	ND	0.5	ND	ND	ND	175
	05-Sep-96	0	0	3	ND	0.4	0	0	ND	200
	01-Jul-02	0	0	11	ND	0.3	0	0	7	250
	05-Nov-02	0	0	2.1	ND	0.4	0	0	ND	200

Select Historical Water Quality Constituents in the City of Banning Water Resource Area

Well Name	Date	Aluminum [µg/L] 50 µg/L[1]	Arsenic [µg/L] 6 µg/L[1]	Chloride [mg/L] 250 mg/L[2]	Color [units] 15 color units[2]	Fluoride [mg/L] 2 mg/L[2]	Iron [µg/L] 300 µg/L[2]	Manganese [mg/L] 0.05 mg/L[2]	Nitrate (as NO3) [mg/L] 45 mg/L[1]	TDS [mg/L] 500 mg/L[2]
City of Banning Well 09 cont.	01-Jan-05			3.3						
	25-May-05								1.5	220
	04-Jan-06	ND	ND	3.3	ND	0.5	ND	ND	2.4	290
	20-Apr-06								2.1	
	17-Apr-07			3.3					2	290
	21-Apr-08								1.2	
	13-Jan-09	ND	ND	1.5	ND	0.5	ND	ND	1.1	220
	26-May-09								ND	
City of Banning Well 10 (LEWIS)	08-Jan-90	ND	ND	1	ND	0.4	50	ND	ND	190
	08-Mar-94	50	ND	2	ND	0.4	ND	ND	1	195
	05-Sep-96	0	0	2	ND	0.4	0	0	2.2	170
	03-Mar-99	60	0	2	3	0.4	130	0	ND	200
	05-Nov-02	0	0	1.7	ND	0.4	0	0	ND	180
	01-Jan-05			1.9						
	25-May-05								1.8	140
	04-Jan-06	ND	ND	1.9	ND	0.4	ND	ND	1.9	180
	20-Apr-06								1.4	
	17-Apr-07			1.9					1.1	180
	21-Apr-08								1.3	
	13-Jan-09	ND	ND	1.2	ND	0.4	ND	ND	1.1	250
	26-May-09								1.2	
City of Banning Well 11	08-Jan-90	ND	ND	1	ND	0.4	90	ND	ND	190
	08-Mar-94	ND	ND	2	ND	0.4	130	ND	ND	175
	05-Sep-96	0	0	1	ND	0.4	270	0	ND	180
	03-Mar-99	0	0	2	3	0.4	110	0	ND	190
	05-Mar-03	0	0	1.3	ND	0.4	140	0	ND	220
	01-Jan-05	120		1.9						
	25-May-05								1.7	170
	04-Jan-06	120	ND	1.9	20	0.4	1200	29	1.8	210
	22-Feb-06						ND			
	20-Apr-06								1.4	
	08-Jun-06				ND					
	17-Apr-07	120		1.9				29	1	210
	21-Apr-08								1.5	
	21-Jan-09	ND	ND	1.2	ND	0.4	ND	ND	1	170
	26-May-09								1.2	

Select Historical Water Quality Constituents in the City of Banning Water Resource Area

Well Name	Date	Aluminum [µg/L] 50 µg/L[1]	Arsenic [µg/L] 6 µg/L[1]	Chloride [mg/L] 250 mg/L[2]	Color [units] 15 color units[2]	Fluoride [mg/L] 2 mg/L[2]	Iron [µg/L] 300 µg/L[2]	Manganese [mg/L] 0.05 mg/L[2]	Nitrate (as NO3) [mg/L] 45 mg/L[1]	TDS [mg/L] 500 mg/L[2]
City of Banning Well 12	29-Jun-05			1.8			140			190
	08-Jan-90	ND	ND	1	ND	0.3	20	ND	ND	195
	08-Mar-94	110	ND	2	ND	0.4	280	ND	ND	180
	05-Sep-96	0	0	2	ND	0.3	100	0	ND	180
	03-Mar-99	0	0	2	ND	0.3	110	0	ND	200
	21-Jul-01	0	0	13	ND	0.7	0	0	8	190
	05-Mar-03	0	0	1.5	ND	0.3	0	0	ND	200
	01-Jan-05			1.8			140			
	25-May-05								1.3	160
	04-Jan-06	ND	ND	1.8	5	0.3	140	ND	1.2	190
	20-Apr-06								1.3	
	17-Apr-07								ND	
	21-Apr-08								1.3	
	21-Jan-09	ND	ND	1.4	ND	0.3	ND	ND	ND	180
	26-May-09								1.2	
City of Banning Well C-02 - ABANDONED	07-Dec-84		ND	14	10	0.4		ND	11	215
City of Banning Well C-02A	10-Jan-86		ND	11	ND	0.2	ND	ND	6	205
	20-Apr-94	250	ND	12	10	0.3	460	ND	7	245
	05-Sep-96	50	0	10	ND	0.4	490	0	6.2	230
	03-Mar-99	0	0	8	ND	0.3	110	0	8	230
	06-Nov-02	0	0	8.3	ND	0.3	0	0	5	260
	01-Jan-05	130		10					9.9	210
	25-May-05								9.7	260
	10-Jan-06	130	ND	10	3	0.3	490	ND	8	210
	06-Feb-06						ND			
	20-Apr-06								9.9	
	24-Apr-07	130		10					5.5	210
	14-Apr-08			8.9					7.1	240
	04-Feb-09	ND	ND	8.9	ND	0.4	ND	ND	7.3	240
	28-Apr-09								7.5	
City of Banning Well C-03	02-Mar-90	ND	ND	11	ND	0.5	30	ND	6	185
	07-Mar-94	120	ND	10	5	0.4	480	ND	6	200
	05-Sep-96	0	0	9	ND	0.4	0	0	5.3	210
	02-Mar-99	360	0	11	10	0.4	440	0	8	170
	06-Nov-02	0	0	10	ND	0.4	0	0	7	220
	25-May-05								6.8	230
	11-Jan-06	ND	ND	10	3	0.4	ND	ND	6.9	180

Select Historical Water Quality Constituents in the City of Banning Water Resource Area

Well Name	Date	Aluminum [µg/L] 50 µg/L[1]	Arsenic [µg/L] 6 µg/L[1]	Chloride [mg/L] 250 mg/L[2]	Color [units] 15 color units[2]	Fluoride [mg/L] 2 mg/L[2]	Iron [µg/L] 300 µg/L[2]	Manganese [mg/L] 0.05 mg/L[2]	Nitrate (as NO3) [mg/L] 45 mg/L[1]	TDS [mg/L] 500 mg/L[2]
City of Banning Well C-03 cont.	20-Apr-06								6.7	
	24-Apr-07			10					4.6	180
	14-Apr-08								6.3	
	04-Feb-09	ND	ND	9.2	ND	0.6	ND	ND	6.7	180
	08-Jun-09								7	
City of Banning Well C-04	07-Mar-94	ND	ND	12	ND	0.3	ND	ND	7	225
	28-Aug-95	ND	ND	13	3	0.3	ND	ND	9	230
	05-Sep-96	0	0	9	ND	0.3	0	0	5.3	220
	09-Dec-96						0			
	02-Mar-99	0	0	9	ND	0.3	0	0	7	210
	06-Nov-02			7.5	ND	0.3		0.004	4	230
	01-Jan-05			9.8					5	210
	11-Jan-06	ND	ND	9.8	ND	0.3	ND	ND	7.4	210
	20-Apr-06								5	
	24-Apr-07			9.8					5.2	210
	14-Apr-08								6.5	
	27-Jan-09	ND	ND	8.8	ND	0.3	ND	ND	6.9	200
	05-May-09								6.5	
City of Banning Well C-05	8-Nov-90	ND	ND	12	ND	1	90	ND	6	180
	7-Mar-94	90	5	17	15	2.4	800	ND	3	180
	28-Aug-95	ND	6	15	3	1.7	ND	ND	5	190
	27-Sep-95					1.7				
	1-Jul-96					1.8				
	5-Sep-96	0	5	13	ND	1.4	0	0	8	180
	9-Dec-96					1.7				
	3-Mar-99	0	7	13	5	2	240	20	5	190
	29-Oct-02			11	ND	1.3			5	190
	11-Jan-06	ND	3.5	13	ND	1.5	ND	ND	5.4	180
	20-Apr-06								5.4	
	17-Apr-07			13					6.1	
	14-Apr-08								5.7	
	3-Feb-09	ND	ND	11	ND	0.2	ND	ND	6	140
	28-Apr-09								5.8	
City of Banning Well C-06	5-Dec-90	ND	ND	14	ND	0.5	70	ND	6	200
	10-Apr-03				3	0.5				
	26-Jul-06	170	ND	14	ND	0.8	480	ND	6.4	240
	22-Aug-06						ND			

Select Historical Water Quality Constituents in the City of Banning Water Resource Area

Well Name	Date	Aluminum [µg/L] 50 µg/L[1]	Arsenic [µg/L] 6 µg/L[1]	Chloride [mg/L] 250 mg/L[2]	Color [units] 15 color units[2]	Fluoride [mg/L] 2 mg/L[2]	Iron [µg/L] 300 µg/L[2]	Manganese [mg/L] 0.05 mg/L[2]	Nitrate (as NO3) [mg/L] 45 mg/L[1]	TDS [mg/L] 500 mg/L[2]
City of Banning Well C-06 cont.	17-Oct-06	ND		12		0.5	ND		1.8	210
	17-Apr-07			14					8.1	240
	14-Apr-08								7.7	
	19-May-09			12					6.7	230
	24-Jun-09	ND	ND	12	ND	0.5	ND	ND	8.1	230
City of Banning Well M-10	1-Jan-05			11					8.7	160
	31-May-05				ND	0.7				
	12-Jan-06	ND	ND	11	ND	0.7	ND	ND	9.2	160
	20-Apr-06								8.7	
	10-Apr-07			11					9.5	160
	28-Apr-08								8.9	
	24-Jun-09	57	ND	11	5	0.7	480	ND	9.4	180
City of Banning Well M-11	1-Jan-05			8.8			170		5.8	280
	31-May-05				ND	0.4				
	12-Jan-06	ND	ND	8.8	ND	0.3	170	ND	5.8	280
	20-Apr-06								5.8	
	10-Apr-07			8.8			170		4.5	280
	28-Apr-08								3.6	
	27-Jan-09	ND	3.3	7.2	ND	0.7	ND	ND	ND	170
	5-May-09								3.6	
City of Banning Well M-12	1-Jan-05			8.5						
	2-Jan-05								4.6	
	3-Jan-05									180
	31-May-05				ND	0.7				
	12-Jan-06	ND	ND	8.5	ND	0.5	ND	ND	6.8	180
	20-Apr-06								4.6	
	10-Apr-07			8.5					6.3	180
	28-Apr-08								7.1	
	25-Feb-09	ND	ND	9.2		0.8	ND	ND	7.5	190
	23-Apr-09								6.4	
	1-Jun-09				ND					
City of Banning Well M-3	1-Jan-05			16					7.8	280
	31-May-05				3	0.4				
	12-Jan-06	ND	ND	16	ND	0.4	ND	ND	7.2	280

Select Historical Water Quality Constituents in the City of Banning Water Resource Area

Well Name	Date	Aluminum [µg/L] 50 µg/L[1]	Arsenic [µg/L] 6 µg/L[1]	Chloride [mg/L] 250 mg/L[2]	Color [units] 15 color units[2]	Fluoride [mg/L] 2 mg/L[2]	Iron [µg/L] 300 µg/L[2]	Manganese [mg/L] 0.05 mg/L[2]	Nitrate (as NO3) [mg/L] 45 mg/L[1]	TDS [mg/L] 500 mg/L[2]
City of Banning Well M-3 cont.	20-Apr-06								7.8	
	17-Apr-07			16					7.1	280
	14-Apr-08								6.4	
	3-Feb-09	ND	ND	14	ND	0.5	ND	ND	7.5	250
City of Banning Well M-7 - INACTIVE	1-Jan-05								8.9	
	31-May-05				15	0.5				
	20-Apr-06								8.9	
	10-Apr-07								8.7	
	27-May-08	ND	ND	13	ND	0.5	ND	ND	8.5	190
	19-May-09								7.3	
City of Banning Well R-1 (Zone 1) 600 - 620 ft bgs	3-Dec-90			28			190	0.03	24	325
City of Banning Well R-1 (Zone 2) 550 - 570 ft bgs	3-Dec-90			21			460	0.02	27	260
City of Banning Well R-1 (Zone 3) 480 - 500 ft bgs	3-Dec-90			23			420	0.03	29	280
City of Banning Well R-1 (Zone 4) 410 - 430 ft bgs	3-Dec-90			50			800	0.11	22	530
Cabazon Water District Well 01	11-Feb-96			9	0		0	0	8.4	
	13-Aug-96	0	2			0.9			8.9	
	08-Mar-99			10			20	0	12.8	
	05-Apr-99				0					
	28-Feb-00				ND					
	20-May-02					0.7				
	19-May-03				ND					
	04-May-05				ND	0.8				
	11-May-06								7.9	250
	30-Jan-08								7	
	13-Nov-08	ND	ND	8.1	ND	0.7	ND	ND	8.2	210
Cabazon Water District Well 02	06-Dec-95			6	ND		ND	ND	7.1	
	11-Dec-96	130	0			0.4			7.1	
	08-Mar-99			6			0	0	8	
	05-Apr-99				0					
	28-Feb-00				ND					
	20-May-02					0.4				
	19-May-03				ND					
	04-May-05				ND	0.4				

Select Historical Water Quality Constituents in the City of Banning Water Resource Area

Well Name	Date	Aluminum [µg/L] 50 µg/L[1]	Arsenic [µg/L] 6 µg/L[1]	Chloride [mg/L] 250 mg/L[2]	Color [units] 15 color units[2]	Fluoride [mg/L] 2 mg/L[2]	Iron [µg/L] 300 µg/L[2]	Manganese [mg/L] 0.05 mg/L[2]	Nitrate (as NO3) [mg/L] 45 mg/L[1]	TDS [mg/L] 500 mg/L[2]
Cabazon Water District Well 02 cont.	11-May-06								6.8	230
	30-Jan-08								6.5	
	13-Nov-08	ND	ND	5.4	ND	0.4	ND	ND	7.6	220
Cabazon Water District Well 03 (Formerly Jenson Well 01)	26-Nov-86		ND	7	5		ND	ND	ND	
	10-Aug-89	ND	ND	16	ND	0.5	160	ND	21	
	13-Jul-93	ND	ND	13	ND	0.3	ND	ND	13	
	29-Mar-95	ND	ND	25	5	0.3	100	ND	35	
	29-Dec-95	0	0	25	ND	0.3	2300	0	30	
	17-Mar-97	0	0	24	3	0.3	250	0	30	
	27-Apr-98	0	0	21	ND	0.4	0	0	33	
	03-Jun-09								23	
	11-Aug-09								20	
Cabazon Water District Well 04	26-Nov-86		ND	7	5	0.1	90	ND	ND	
	10-Aug-89	ND	ND	14	ND	0.5	80	ND	10	
Cabazon Water District Well 04 (Formerly Jenson Well 02) - DESTROYED cont.	22-Sep-93	ND	ND	15	10	0.3	650	ND	11	
	29-Mar-95	ND	ND	12	3	0.3	100		11	
	29-Dec-95	0	0	12	ND	0.3	1000	0	9	
	17-Mar-97	0	0	13	10	0.5	690	0	8	
USGS monitoring Well 3S/1E-11F1	16-Jul-09	8.5	0.43	13.5		0.39	2*	0.7		232
USGS monitoring Well 3S/1E-11F2	16-Jul-09	5.3	1.3	15.2		0.42	2	3.6		264
USGS monitoring Well 3S/1E-11F3	16-Jul-09	6.5	0.85	15.2		0.49	2*	3.8	25.9*	296
USGS monitoring Well 3S/1E-11F4	16-Jul-09	17.9	5.1	13.8		0.44	10	1.2	39.7	338

* Estimated Value as displayed on USGS water Quality Website

Note: ND = Not Detected

Shaded cells exceed Maximum Contamination Level (MCL)

Values of zero were as reported by the California Department of Human Services

[1] Primary MCL

[2] Secondary MCL

[3] US EPA Treatment Technique Value

APPENDIX D

Appropriators and Their Water Rights

Exhibit C of the Beaumont Basin Judgment

GEOSCIENCE

Exhibit C
Appropriators and Their Water Rights

(1) Producer	(2) Average Production during 1997-2001 (acre-ft/yr)	(3) Share of Safe Yield Allocated to Appropriators	(4) Initial Estimate of Appropriate Rights[1] (acre-ft/yr)	(5) Controlled Overdraft and Supplemental Water Recharge Allocation [2] (acre-ft/yr)	(6) Operating Yield (acre-ft/yr)
Banning, City of	2,170	31.43%	882	5,029	5,910
City of Beaumont	0	0.00%	0	0	0
Beaumont Cherry Valley Water District	2,936	42.51%	1,193	6,802	7,995
South Mesa Water Company	862	12.48%	350	1,996	2,346
Yucaipa Valley Water District	938	13.58%	381	2,173	2,554
Totals	6,906	100.00%	2,805	16,000	18,805

Note 1 – Based on a 8,650 acre-ft/yr safe yield

Note 2– Controlled overdraft will not exceed 160,000 acre-ft during for first ten years of operation under the physical solution

GEOSCIENCE

P.O. Box 220, Claremont, CA 91711 | P: 909.451.6650 | F: 909.451.6638 | www.gssiwater.com

APPENDIX G

Superior Court for the State of California Judgment

Adjudicating Groundwater Rights in the Beaumont Basin

ORIGINAL

COPY

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AKLUFI AND WYSOCKI
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Riverside, California 92501
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NO FILING FEE REQUIRED PER GOVERNMENT CODE, SEC. 6103

FILED
SUPERIOR COURT OF CALIFORNIA
COUNTY OF RIVERSIDE

FEB - 4 2004

Attorneys for Plaintiff, SAN TIMOTEO WATERSHED MANAGEMENT AUTHORITY

SUPERIOR COURT OF THE STATE OF CALIFORNIA

FOR THE COUNTY OF RIVERSIDE, RIVERSIDE COURT

SAN TIMOTEO WATERSHED MANAGEMENT AUTHORITY, a public agency,

Plaintiff,

vs.

CITY OF BANNING, a municipal corporation; BEAUMONT-CHERRY VALLEY WATER DISTRICT, an irrigation district; YUCAIPA VALLEY WATER DISTRICT, a county water district; PLANTATION ON THE LAKE LLC, a California limited liability company; SHARONDALE MESA OWNERS ASSOCIATION, an unincorporated association; SOUTH MESA MUTUAL WATER COMPANY, a mutual water company; CALIFORNIA OAK VALLEY GOLF AND RESORT LLC, a California limited liability company; OAK VALLEY PARTNERS LP, a Texas limited partnership; SOUTHERN CALIFORNIA SECTION OF THE PROFESSIONAL GOLFERS ASSOCIATION OF AMERICA, a California corporation; SUNNY-CAL EGG AND POULTRY COMPANY, a California corporation; MANHEIM, MANHEIM & BERMAN, a California General Partnership; WALTER M. BECKMAN, individually and as Trustee of the BECKMAN FAMILY TRUST dated December 11, 1990; THE ROMAN CATHOLIC BISHOP of San Bernardino,

CASE NO. RIC 389197

STIPULATION FOR ENTRY OF JUDGMENT ADJUDICATING GROUNDWATER RIGHTS IN THE BEAUMONT BASIN

AKLUFI AND WYSOCKI
3403 TENTH STREET, SUITE 610
RIVERSIDE, CALIFORNIA 92501
(909) 682-5480

a California corporation; MERLIN PROPERTIES, LLC; LEONARD M. STEARNS and DOROTHY D. STEARNS, individually and as Trustees of the LEONARD M. STEARNS FAMILY TRUST OF 1991; and DOES 1 through 500, inclusive,

Defendants.

I. STIPULATING PARTIES IDENTIFIED

The following parties, and each of them, agree to the terms of this Stipulation:

Plaintiff:

SAN TIMOTEO WATERSHED MANAGEMENT AUTHORITY

Overlying Defendants:

1. SHARONDALE MESA OWNERS ASSOCIATION, an unincorporated association
2. CALIFORNIA OAK VALLEY GOLF AND RESORT LLC, a California limited liability company
3. OAK VALLEY PARTNERS LP, a Texas limited partnership
4. SOUTHERN CALIFORNIA SECTION OF THE PROFESSIONAL GOLFERS ASSOCIATION OF AMERICA, a California corporation
5. SUNNY-CAL EGG AND POULTRY COMPANY, a California corporation
6. MANHEIM, MANHEIM & BERMAN, a California general partnership
7. WALTER M. BECKMAN, individually, and as Trustee of the BECKMAN FAMILY TRUST dated December 11, 1990
8. THE ROMAN CATHOLIC BISHOP of San Bernardino, a California corporation
9. MERLIN PROPERTIES, LLC
10. LEONARD M. STEARNS and DOROTHY D. STEARNS, individually and as Trustees of the LEONARD M. STEARNS FAMILY TRUST OF 1991
11. PLANTATION ON THE LAKE LLC, a California limited liability company

Appropriating Defendants:

1. CITY OF BANNING, a municipal corporation
2. BEAUMONT-CHERRY VALLEY WATER DISTRICT, an irrigation district
3. SOUTH MESA MUTUAL WATER COMPANY, a mutual water company
4. YUCAIPA VALLEY WATER DISTRICT, a county water district

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RIVERSIDE, CA[illegible]FORNIA 92501
(909) 682-5480

II. RECITALS

WHEREAS, plaintiff is a joint powers public agency, formed in 2001 for the purpose, among others, of preparing and implementing a Water Resources Management Plan for the San Timoteo Watershed and the waters tributary thereto, including the Beaumont Basin, in order to conserve local water supplies, improve surface and subsurface water quality and quantity, and to protect and enhance groundwater storage, for the benefit of the public;

WHEREAS, the Beaumont Basin, also known as the Beaumont Storage Unit, is the common source of water supply for appropriative water uses within the communities of Banning, Beaumont, Cherry Valley and Calimesa, and for various overlying uses including, but not limited to, golf courses and related facilities and agricultural production, including egg production and related agricultural irrigation uses;

WHEREAS, the maximum quantity of water which can be produced from the Beaumont Basin, at safe yield, is currently estimated to be 8650 acre feet per year, and the total groundwater production from the Beaumont Basin has exceeded and continues to exceed its safe yield;

WHEREAS, much of the land area within and adjacent to the Beaumont Basin is proposed to be intensively developed with residential, commercial and industrial uses, which will place additional demands on local water resources;

WHEREAS, it is estimated that the Beaumont Basin has the capability of storing more than 200,000 acre feet of water for overlying and appropriative use by water users within and adjacent to the Beaumont Basin;

WHEREAS, the plaintiff proposes to invest substantial public funds to construct facilities that will enable the storage of water within the Beaumont Basin, in addition to the storage that occurs naturally;

WHEREAS, the Overlying and Appropriating Defendants wish to secure the provision and availability of a reliable, affordable, long-term water supply for the area within plaintiff's jurisdiction, making reasonable and beneficial use of the native groundwater in the Beaumont Basin, and other local water resources, promoting the importation of water into the area, and storage of such water, and local surface waters, in the Beaumont Basin;

WHEREAS, the Overlying Defendants believe that it is in their best interest to enter into this Stipulation and be subject to the attached Judgment, rather than continue to litigate the safe yield of the Beaumont Basin, the quantity of their overlying rights, both historical and unexercised, the rights they may have to use the storage volume existing beneath their respective lands, and other issues;

WHEREAS, in order to protect existing overlying and appropriative uses and to justify and protect the public investment necessary to utilize the available groundwater storage capacity in the Beaumont Basin, it is necessary to adjudicate the Beaumont Basin and to define the respective water rights of the overlying and appropriative producers of groundwater.

NOW, THEREFORE, the undersigned parties, and each of them, hereby agree to the following Stipulated Terms.

AKLUFI A[illegible] WYSOCKI
3403 TENTH [illegible]T, SUITE 610
RIVERSIDE, CALIFORNIA 92501
(909) 682-5480

III. STIPULATED TERMS

1. <u>Form of Judgment</u>: Judgment may be filed and entered in the form attached hereto as Exhibit "1" and made a part hereof.

2. <u>Fees and Costs</u>: Each party shall bear its own costs, attorneys fees and litigation expenses arising out of this adjudication.

3. <u>Waiver</u>: Notice of entry of judgment, the right to trial, stay of execution and appeal, is hereby waived, except as expressly set forth in the Judgment.

4. <u>Binding Effect</u>: This Stipulation and all obligations herein, shall be binding on and shall inure to the benefit of the heirs, executors, administrators, successors and assigns of the parties hereto.

5. <u>Construction and Interpretation</u>: No adverse construction or interpretation of this Stipulation shall be made under the Civil Code simply because the parties drafted or participated in the drafting of this Stipulation. The terms of the Judgment shall be interpreted to further the purposes of this Stipulation.

6. <u>Jurisdiction and Venue</u>: The Superior Court of California in and for the County of Riverside shall have jurisdiction of this matter. In the event of any litigation arising out of this Stipulation, venue shall conclusively be deemed to lie in the County of Riverside.

7. <u>Advice of Counsel</u>: The undersigned each have had the opportunity to consult with or have consulted with their own legal counsel regarding this Stipulation and all matters set forth herein, or have knowingly waived the right to do so.

RIVERSIDE, CALIFORNIA 92501
(909) 682-5480

8. Authority: Each person executing this Stipulation on behalf of any of the undersigned has been fully empowered to execute this Stipulation and that all necessary action for the execution of this Stipulation has been taken.

IT IS SO STIPULATED:

SAN TIMOTEO WATERSHED MANAGEMENT AUTHORITY

Dated: 1/6/04

By ______________________
President, Board of Directors

CITY OF BANNING

Dated: 12/23/03

By ______________________
Mayor

BEAUMONT-CHERRY VALLEY WATER DISTRICT

Dated: ______________________

By ______________________
President, Board of Directors

YUCAIPA VALLEY WATER DISTRICT

Dated: ______________________

By ______________________
President, Board of Directors

PLANTATION ON THE LAKE LLC

Dated: ______________________

By ______________________
President, Board of Directors

SHARONDALE MESA OWNERS ASSOCIATION

Dated: ______________________

By ______________________
President, Board of Directors

ARKLUFI AND WYSOCKI
3403 TENTH STREET, SUITE 610
RIVERSIDE, CALIFORNIA 92501
(909) 682-5480

8. Authority: Each person executing this Stipulation on behalf of any of the undersigned has been fully empowered to execute this Stipulation and that all necessary action for the execution of this Stipulation has been taken.

IT IS SO STIPULATED:

SAN TIMOTEO WATERSHED MANAGEMENT AUTHORITY

Dated: ____________________ By ______________________________
President, Board of Directors

CITY OF BANNING

Dated: ____________________ By ______________________________
Mayor

BEAUMONT-CHERRY VALLEY WATER DISTRICT

Dated: July 3, 2003 By ______________________________
President, Board of Directors

YUCAIPA VALLEY WATER DISTRICT

Dated: ____________________ By ______________________________
President, Board of Directors

PLANTATION ON THE LAKE LLC

Dated: ____________________ By ______________________________
President, Board of Directors

SHARONDALE MESA OWNERS ASSOCIATION

Dated: ____________________ By ______________________________
President, Board of Directors

8. <u>Authority</u>: Each person executing this Stipulation on behalf of any of the undersigned has been fully empowered to execute this Stipulation and that all necessary action for the execution of this Stipulation has been taken.

IT IS SO STIPULATED:

SAN TIMOTEO WATERSHED MANAGEMENT AUTHORITY

Dated: ____________________ By ______________________________
President, Board of Directors

CITY OF BANNING

Dated: ____________________ By ______________________________
Mayor

BEAUMONT-CHERRY VALLEY WATER DISTRICT

Dated: ____________________ By ______________________________
President, Board of Directors

YUCAIPA VALLEY WATER DISTRICT

Dated: 10/1/03 By [signature]
President, Board of Directors

PLANTATION ON THE LAKE LLC

Dated: ____________________ By ______________________________
President, Board of Directors

SHARONDALE MESA OWNERS ASSOCIATION

Dated: ____________________ By ______________________________
President, Board of Directors

AKLUFI AND WYSOCKI
3403 TENTH STREET, SUITE 610
RIVERSIDE, CALIFORNIA 92501
(909) 682-5480

8. Authority: Each person executing this Stipulation on behalf of any of the undersigned has been fully empowered to execute this Stipulation and that all necessary action for the execution of this Stipulation has been taken.

IT IS SO STIPULATED:

SAN TIMOTEO WATERSHED MANAGEMENT AUTHORITY

Dated: ____________________ By ______________________________
President, Board of Directors

CITY OF BANNING

Dated: ____________________ By ______________________________
Mayor

BEAUMONT-CHERRY VALLEY WATER DISTRICT

Dated: ____________________ By ______________________________
President, Board of Directors

YUCAIPA VALLEY WATER DISTRICT

Dated: ____________________ By ______________________________
President, Board of Directors

PLANTATION ON THE LAKE LLC

Dated: 7/30/03 By [signature] James H Krueger
~~President, Board of Directors~~
Manager of Meadows Management Company LLC, Manager

SHARONDALE MESA OWNERS ASSOCIATION

Dated: ____________________ By ______________________________
President, Board of Directors

RIVERSIDE, C... ORNIA 92501
(909) 682-5480

8. <u>Authority</u>: Each person executing this Stipulation on behalf of any of the undersigned has been fully empowered to execute this Stipulation and that all necessary action for the execution of this Stipulation has been taken.

IT IS SO STIPULATED:

SAN TIMOTEO WATERSHED MANAGEMENT AUTHORITY

Dated: ______________________ By ______________________________
President, Board of Directors

CITY OF BANNING

Dated: ______________________ By ______________________________
Mayor

BEAUMONT-CHERRY VALLEY WATER DISTRICT

Dated: ______________________ By ______________________________
President, Board of Directors

YUCAIPA VALLEY WATER DISTRICT

Dated: ______________________ By ______________________________
President, Board of Directors

PLANTATION ON THE LAKE LLC

Dated: ______________________ By ______________________________
President, Board of Directors

SHARONDALE MESA OWNERS ASSOCIATION

Dated: June 27, 2003 By Lena Jo Alexander
President, Board of Directors

ARLUFI AND WYSOCKI
3403 TENTH S T, SUITE 610
RIVERSIDE, C ORNIA 92501
(909) 682-5480

	SOUTH MESA MUTUAL WATER COMPANY
Dated: 6-27-03	By [signature] President, Board of Directors
	CALIFORNIA OAK VALLEY GOLF AND RESORT LLC
Dated: ______________	By ______________ President, Board of Directors
	OAK VALLEY PARTNERS LP, A Texas Limited Partnership By: Oak Valley-Hunt, Inc. a Texas Corporation Managing General Partner
Dated: ______________	By ______________ D. CRAIG MARTIN Its: President
	SOUTHERN CALIFORNIA SECTION OF THE PROFESSIONAL GOLFERS ASSOCIATION OF AMERICA
Dated: ______________	By ______________ President, Board of Directors
	SUNNY-CAL EGG AND POULTRY COMPANY
Dated: ______________	By ______________ President, Board of Directors
	MANHEIM, MANHEIM & BERMAN
Dated: ______________	By ______________

RIVERSIDE, CALIFORNIA 92501
(909) 682-5480

SOUTH MESA MUTUAL WATER COMPANY

Dated: ____________________ By ____________________________
President, Board of Directors

CALIFORNIA OAK VALLEY GOLF AND RESORT LLC

Dated: 7-31-2003 By ____________________________
President, Board of Directors

OAK VALLEY PARTNERS LP,
A Texas Limited Partnership

By: Oak Valley-Hunt, Inc.
a Texas Corporation
Managing General Partner

Dated: ____________________ By ____________________________
D. CRAIG MARTIN

Its: President

SOUTHERN CALIFORNIA SECTION OF THE PROFESSIONAL GOLFERS ASSOCIATION OF AMERICA

Dated: ____________________ By ____________________________
President, Board of Directors

SUNNY-CAL EGG AND POULTRY COMPANY

Dated: ____________________ By ____________________________
President, Board of Directors

MANHEIM, MANHEIM & BERMAN

Dated: ____________________ By ____________________________

...AND WYSOCKI
3403 TENTH ...T, SUITE 610
RIVERSIDE, C...ORNIA 92501
(909) 682-5480

SOUTH MESA MUTUAL WATER COMPANY

Dated: ____________________ By ______________________________
President, Board of Directors

CALIFORNIA OAK VALLEY GOLF AND RESORT LLC

Dated: ____________________ By ______________________________
President, Board of Directors

OAK VALLEY PARTNERS LP,
A Texas Limited Partnership

By: Oak Valley-Hunt, Inc.
a Texas Corporation
Managing General Partner

Dated: ____________________ By ______________________________
D. CRAIG MARTIN

Its: President

SOUTHERN CALIFORNIA SECTION OF THE PROFESSIONAL GOLFERS ASSOCIATION OF AMERICA

Dated: ____________________ By ______________________________
President, Board of Directors

SUNNY-CAL EGG AND POULTRY COMPANY

Dated: ____________________ By ______________________________
President, Board of Directors

MANHEIM, MANHEIM & BERMAN

Dated: ____________________ By ______________________________

RIVERSIDE, IFORNIA 92501
(909) 682-5480

SOUTH MESA MUTUAL WATER COMPANY

Dated: ______________________ By ______________________________
President, Board of Directors

CALIFORNIA OAK VALLEY GOLF AND RESORT LLC

Dated: ______________________ By ______________________________
President, Board of Directors

OAK VALLEY PARTNERS LP,
A Texas Limited Partnership

By: Oak Valley-Hunt, Inc.
a Texas Corporation
Managing General Partner

Dated: ______________________ By ______________________________
D. CRAIG MARTIN

Its: President

SOUTHERN CALIFORNIA SECTION OF THE PROFESSIONAL GOLFERS ASSOCIATION OF AMERICA

Dated: July 8, 2003 By Thomas C. Gustafson
~~President~~, ~~Board of Directors~~
CHIEF Executive Officer

SUNNY-CAL EGG AND POULTRY COMPANY

Dated: ______________________ By ______________________________
President, Board of Directors

MANHEIM, MANHEIM & BERMAN

Dated: ______________________ By ______________________________

3403 TENTH STREET, SUITE 610
RIVERSIDE, CALIFORNIA 92501
(909) ...2-5480

SOUTH MESA MUTUAL WATER COMPANY

Dated: ________________ By ______________________________
President, Board of Directors

CALIFORNIA OAK VALLEY GOLF AND RESORT LLC

Dated: ________________ By ______________________________
President, Board of Directors

OAK VALLEY PARTNERS LP,
A Texas Limited Partnership

By: Oak Valley-Hunt, Inc.
a Texas Corporation
Managing General Partner

Dated: ________________ By ______________________________
D. CRAIG MARTIN

Its: President

SOUTHERN CALIFORNIA SECTION OF THE PROFESSIONAL GOLFERS ASSOCIATION OF AMERICA

Dated: ________________ By ______________________________
President, Board of Directors

SUNNY-CAL EGG AND POULTRY COMPANY

Dated: ________________ By Michael Markson
President, Board of Directors

MANHEIM, MANHEIM & BERMAN

Dated: ________________ By Walter Berman

3403 TENTH [illegible]T, SUITE 610
RIVERSIDE, C[illegible]ORNIA 92501
(909) 682-5480

Dated: 7-23-03 Walter M. Beckman
WALTER M. BECKMAN

Dated: 7-23-03 Walter M. Beckman
WALTER M. BECKMAN, Trustee of the BECKMAN FAMILY TRUST dated December 11, 1990

Dated: ____________ ____________
CECIL MERLE MURRAY

MERLIN PROPERTIES, LLC

Dated: ____________ By ____________

Dated: ____________ ____________
LEONARD M. STEARNS, individually and as Trustee of the LEONARD M. STEARNS FAMILY TRUST OF 1991

Dated: ____________ ____________
DOROTHY D. STEARNS, individually and as Trustee of the LEONARD M. STEARNS FAMILY TRUST OF 1991

APPROVAL AND ORDER

The foregoing Stipulation is hereby approved and is so ordered.

Dated: ____________

____
JUDGE OF THE SUPERIOR COURT

Dated: ____________________ ____________________________
WALTER M. BECKMAN

Dated: ____________________ ____________________________
WALTER M. BECKMAN, Trustee of the BECKMAN FAMILY TRUST dated December 11, 1990

THE ROMAN CATHOLIC BISHOP of San Bernardino, a California corporation

Dated: 9/18/03 By Msgr. [signature]

MERLIN PROPERTIES, LLC

Dated: ____________________ By ____________________________

Dated: ____________________ ____________________________
LEONARD M. STEARNS, individually and as Trustee of the LEONARD M. STEARNS FAMILY TRUST OF 1991

Dated: ____________________ ____________________________
DOROTHY D. STEARNS, individually and as Trustee of the LEONARD M. STEARNS FAMILY TRUST OF 1991

APPROVAL AND ORDER

The foregoing Stipulation is hereby approved and is so ordered.

Dated: ____________________

____
JUDGE OF THE SUPERIOR COURT

RIVERSIDE, CALIFORNIA 92501
(909) 682-5480

Dated: ____________________ ______________________________
WALTER M. BECKMAN

Dated: ____________________ ______________________________
WALTER M. BECKMAN, Trustee of the BECKMAN FAMILY TRUST dated December 11, 1990

THE ROMAN CATHOLIC BISHOP of San Bernardino, a California corporation

Dated: ____________________ By ______________________________

MERLIN PROPERTIES, LLC

Dated: JULY 31, 2003 By [signature]

Dated: ____________________ ______________________________
LEONARD M. STEARNS, individually and as Trustee of the LEONARD M. STEARNS FAMILY TRUST OF 1991

Dated: ____________________ ______________________________
DOROTHY D. STEARNS, individually and as Trustee of the LEONARD M. STEARNS FAMILY TRUST OF 1991

APPROVAL AND ORDER

The foregoing Stipulation is hereby approved and is so ordered.

Dated: ____________________

____
JUDGE OF THE SUPERIOR COURT

3403 TENTH ST[illegible], SUITE 610
RIVERSIDE, C[illegible]RNIA 92501
(909) [illegible]-5480

Dated: ______________ ______________________________
WALTER M. BECKMAN

Dated: ______________ ______________________________
WALTER M. BECKMAN, Trustee of the BECKMAN FAMILY TRUST dated December 11, 1990

Dated: ______________ ______________________________
CECIL MERLE MURRAY

MERLIN PROPERTIES, LLC

Dated: ______________ By ___________________________

Dated: 7-23-03 Leonard M. Stearns
LEONARD M. STEARNS, individually and as Trustee of the LEONARD M. STEARNS FAMILY TRUST OF 1991

Dated: 7-23-03 Dorothy D. Stearns
DOROTHY D. STEARNS, individually and as Trustee of the LEONARD M. STEARNS FAMILY TRUST OF 1991

APPROVAL AND ORDER

The foregoing Stipulation is hereby approved and is so ordered.

Dated: FEB - 4 2004

GARY TRANBARGER
JUDGE OF THE SUPERIOR COURT

ORIGINAL COPY

JOSEPH S. AKLUFI (Bar No. 68619)
AKLUFI AND WYSOCKI
3403 Tenth Street, Suite 610
Riverside, California 92501
(909)682-5480 Office
(909)682-2619 Fax

Attorneys for Plaintiff, SAN TIMOTEO WATERSHED MANAGEMENT AUTHORITY

NO FILING FEE REQUIRED PER GOVERNMENT CODE, SEC. 6103

FILED
SUPERIOR COURT OF CALIFORNIA
COUNTY OF RIVERSIDE

FEB - 4 2004

SUPERIOR COURT OF THE STATE OF CALIFORNIA

FOR THE COUNTY OF RIVERSIDE, RIVERSIDE COURT

SAN TIMOTEO WATERSHED MANAGEMENT AUTHORITY, a public agency, Plaintiff, vs. CITY OF BANNING, a municipal corporation; BEAUMONT-CHERRY VALLEY WATER DISTRICT, an irrigation district; YUCAIPA VALLEY WATER DISTRICT, a county water district; PLANTATION ON THE LAKE LLC, a California limited liability company; SHARONDALE MESA OWNERS ASSOCIATION, an unincorporated association; SOUTH MESA MUTUAL WATER COMPANY, a mutual water company; CALIFORNIA OAK VALLEY GOLF AND RESORT LLC, a California limited liability company; OAK VALLEY PARTNERS LP, a Texas limited partnership; SOUTHERN CALIFORNIA SECTION OF THE PROFESSIONAL GOLFERS ASSOCIATION OF AMERICA, a California corporation; SUNNY-CAL EGG AND POULTRY COMPANY, a California corporation; MANHEIM, MANHEIM & BERMAN, a California General Partnership; WALTER M. BECKMAN, individually and as Trustee of the BECKMAN FAMILY TRUST dated December 11, 1990; THE ROMAN CATHOLIC BISHOP of San Bernardino,	CASE NO. RIC 389197 JUDGMENT PURSUANT TO STIPULATION ADJUDICATING GROUNDWATER RIGHTS IN THE BEAUMONT BASIN

AKLUFI AND WYSOCKI
3403 TENTH STREET, SUITE 610
RIVERSIDE, CALIFORNIA 92501
(909) 682-5480

a California corporation; MERLIN PROPERTIES, LLC; LEONARD M. STEARNS and DOROTHY D. STEARNS, individually and as Trustees of the LEONARD M. STEARNS FAMILY TRUST OF 1991; and DOES 1 through 500, inclusive,

Defendants.

I. INTRODUCTION

1. Pleadings, Parties and Jurisdiction

The complaint herein was filed on February 20, 2003, seeking an adjudication of water rights, injunctive relief and the imposition of a physical solution. The defaults of certain defendants have been entered, and certain other defendants dismissed. Other than defendants who have been dismissed or whose defaults have been entered, all defendants have appeared herein. This Court has jurisdiction of the subject matter of this action and of the parties herein.

2. Stipulation for Judgment

Stipulation for Entry of Judgment has been filed by and on behalf of all defendants who have appeared herein.

3. Definitions

As used in this Judgment, these terms shall have the following meanings:

A. Appropriator or Appropriator Parties: the pumpers identified in Exhibit "C" attached hereto.

B. Appropriator's Production Right: consists of an Appropriator's share of Operating Yield, plus (1) any water acquired by an Appropriator from an Overlying Producer or other Appropriator pursuant to this Judgment, (2) any water

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RIVERSIDE, CALIFORNIA 92501
(909) 682-5480

withdrawn from the Appropriator's storage account, (3) and New Yield created by the Appropriator.

C. Appropriative Water: the amount of Safe Yield remaining after satisfaction of Overlying Water Rights.

D. Appropriative Water Right: each Appropriator's share of Appropriative Water, such share expressed as a percentage as shown on Exhibit "C".

E. Beaumont Basin or Beaumont Storage Unit: the area situated within the boundaries shown on Exhibit "A" attached hereto.

F. Conjunctive Use: the storage of water in a Groundwater Basin for use at a later time.

G. Groundwater: water beneath the surface of the ground within the zone below the water table in which soil is saturated with water.

H. Groundwater Basin: an area underlain by one or more permeable formations capable of furnishing a substantial water supply.

I. Groundwater Storage Agreement: a standard form of written agreement between the Watermaster and any Person requesting the storage of Supplemental Water.

J. Groundwater Storage Capacity: the space available in a Groundwater Basin that is not utilized for storage or regulation of Safe Yield and is reasonably available for Stored Water and Conjunctive Use.

K. Minimal Producer: any Producer who pumps 10 or fewer acre feet of Groundwater from the Beaumont Basin per year.

AKLUFI A[illegible] WYSOCKI
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RIVERSIDE, CA[illegible]IFORNIA 92501
(909) 682-5480

L. New Yield: increases in yield in quantities greater than historical amounts from sources of supply including, but not limited to, capture of available storm flow, by means of projects constructed after February 20, 2003, as determined by the Watermaster.

M. Operating Yield: the maximum quantity of water which can be produced annually by the Appropriators from the Beaumont Basin, which quantity consists of Appropriative Water plus Temporary Surplus.

N. Overdraft: a condition wherein the total annual production from a Groundwater Basin exceeds the Safe Yield thereof.

O. Overlying Parties: the Persons listed on Exhibit "B", who are owners of land which overlies the Beaumont Basin and have exercised Overlying Water Rights to pump therefrom. Overlying Parties include successors in interest and assignees.

P. Overlying Water Rights: the quantities decreed to Overlying Parties in Column 4 of Exhibit "B" to this Judgment.

Q. Overproduction: by an Appropriator, measured by an amount equal to the Appropriator's actual annual production minus the Appropriator's Production Right. By a new overlying producer, an amount equal to what the overlying producer pumped during the year.

R. Party (Parties): any Person(s) named in this action, or who has intervened, or has become subject to this Judgment either through stipulation, trial or otherwise

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(909) 682-5480

S. Person: any individual, partnership, association, corporation, governmental entity or agency, or other organization.

T. Physical Solution: the physical solution set forth in Part V of this Judgment.

U. Produce, Producing, Production, Pump or Pumping: the extraction of groundwater.

V. Producer or Pumper: any Person who extracts groundwater.

W. Recycled Water: has the meaning provided in Water Code Section 13050(n) and includes other nonpotable water for purposes of this Judgment.

X. Safe Yield: the maximum quantity of water which can be produced annually from a Groundwater Basin under a given set of conditions without causing a gradual lowering of the groundwater level leading eventually to depletion of the supply in storage. The Safe Yield of the Beaumont Basin is 8650 acre feet per year in each of the ten (10) years following entry of this Judgment.

Y. San Timoteo Watershed Management Authority: a joint powers public agency whose members are the Beaumont-Cherry Valley Water District, the City of Beaumont, the South Mesa Mutual Water Company and the Yucaipa Valley Water District.

Z. Stored Water: Supplemental Water stored in the Beaumont Basin pursuant to a Groundwater Storage Agreement with the Watermaster.

AA. Supplemental Water: water imported into the

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RIVERSIDE, CALIFORNIA 92501
(909) 682-5480

Beaumont Basin from outside the Beaumont Basin including, without limitation, water diverted from creeks upstream and tributary to Beaumont Basin and water which is recycled and useable within the Beaumont Basin.

BB. Temporary Surplus: the amount of groundwater that can be pumped annually in excess of Safe Yield from a Groundwater Basin necessary to create enough additional storage capacity to prevent the waste of water.

CC. Watermaster: the Person appointed by the Court to administer and enforce the Physical Solution.

4. List of Exhibits

The following exhibits are attached to this Judgment and made a part hereof:

Exhibit "A" -- "Location Map of Beaumont Basin"
Exhibit "B" -- "Overlying Owners and Their Water Rights"
Exhibit "C" -- "Appropriators and Their Water Rights"
Exhibit "D" -- "Legal Description of Lands of the Overlying Parties"
Exhibit "E" -- "Location of Overlying Producer Parcels and Boundary of the Beaumont Basin"

II. INJUNCTIONS

1. Injunction Against Unauthorized Production of Beaumont Basin Water

Each party herein is enjoined, as follows:

A. Overlying Parties: Each defendant who is an Overlying Party, and its officers, agents, employees, successors and assigns, is hereby enjoined and restrained from producing groundwater from the Beaumont Basin in any five-year period hereafter in excess of five times the share of the Safe Yield assigned to the Overlying Parties as set

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RIVERSIDE, CALIFORNIA 92501
(909) 682-5480

forth in Column 4 of Exhibit "B", as more fully described in the Physical Solution.

B. Appropriator Parties: Each defendant who is an Appropriator Party, and its officers, agents, employees, successors and assigns, is hereby enjoined and restrained from producing groundwater from the Beaumont Basin in any year hereafter in excess of such party's Appropriator's Production Right, except as additional annual Production may be authorized by the provisions of the Physical Solution.

2. Injunction Against Unauthorized Storage or Withdrawal of Stored Water

Each and every Party, and its officers, agents, employees, successors and assigns, is hereby enjoined and restrained from storing Supplemental Water in the Beaumont Basin for withdrawal, or causing withdrawal of water stored by that Party, except pursuant to the terms of a written Groundwater Storage Agreement with the Watermaster and in accordance with Watermaster Rules and Regulations. Any Supplemental Water stored in the Beaumont Basin, except pursuant to a Groundwater Storage Agreement, shall be deemed abandoned and not classified as Stored Water.

III. DECLARATION AND ADJUSTMENT OF RIGHTS

8650

1. Overlying Rights

The Overlying Parties are currently exercising Overlying Water Rights in the Beaumont Basin. As shown on Exhibit "B", the aggregate Projected Maximum Production of water from the Beaumont Basin pursuant to Overlying Water Rights is 8610 acre feet and the Overlying Water Rights are individually decreed, in Column 4 of Exhibit "B", for each Overlying Party. The Overlying Parties

AKLUFI AND WYSOCKI
3403 TENTH STREET, SUITE 610
RIVERSIDE, CALIFORNIA 92501
(909) 682-5480

shall continue to have the right to exercise their respective Overlying Water Right as set forth in Column 4 of Exhibit "B" except to the extent their respective properties receive water service from an Appropriator Party, as contemplated by Paragraph III.3 of this Judgment.

2. Appropriator's Share of Operating Yield

Each Appropriator Party's share of Operating Yield is shown on Exhibit "C". Notwithstanding any other provision of this Judgment, each Appropriator Party may use its Appropriator's Production Right anywhere within its service area.

3. Adjustment of Rights

A. The Overlying Parties shall have the right to exercise their respective Overlying Water Rights except as provided in this Paragraph 3.

B. To the extent any Overlying Party requests, and uses its Exhibit "B", Column 4 water to obtain water service from an Appropriator Party, an equivalent volume of potable groundwater shall be earmarked by the Appropriator Party which will serve the Overlying Party, up to the volume of the Overlying Water Right as reflected in Column 4 of Exhibit "B" attached hereto, for the purpose of serving the Overlying Party. The intent of this provision is to ensure that the Overlying Party is given credit towards satisfying the water availability assessment provisions of Government Code, Section 66473.7 et seq. and Water Code, Section 10910 et seq. or other similar provisions of law, equal to the amount of groundwater earmarked hereunder.

C. When an Overlying Party receives water service as

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RIVERSIDE, CALIFORNIA 92501
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provided for in subparagraph III.3.B the Overlying Party shall forebear the use of that volume of the Overlying Water Right earmarked by the Appropriator Party. The Appropriator Party providing such service shall have the right to produce the volume of water foregone by the Overlying Party, in addition to other rights otherwise allocated to the Appropriator Party.

D. Should the volume of the Overlying Water Right equal or exceed the volume of potable groundwater earmarked as provided in subparagraph 3.B, the Appropriator Party which will serve the Overlying Party shall (i) impose potable water charges and assessments upon the Overlying Party and its successors in interest at the rates charged to the then-existing regular customers of the Appropriator Party, and (ii) not collect from such Overlying Party any development charge that may be related to the importation of water into the Beaumont Basin. The Appropriator Party which will serve the Overlying Party pursuant to Subparagraph III.3.B shall also consider, and negotiate in good faith regarding, the provision of a meaningful credit for any pipelines, pump stations, wells or other facilities that may exist on the property to be served.

E. In the event an Overlying Party receives Recycled Water from an Appropriator Party to serve an overlying use served with groundwater, the Overlying Water Right of the Overlying Party shall not be diminished by the receipt and use of such Recycled Water. Recycled Water provided by an Appropriator Party to an Overlying Party shall satisfy the

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criteria set forth in the California Water Code including, without limitation, the criteria set forth in Water Code Sections 13550 and 13551. The Appropriator Party which will serve the Recycled Water shall have the right to use that portion of the Overlying Water Right of the Overlying Party offset by the provision of Recycled Water service pursuant to the terms of this subparagraph; provided, however, that such right of use by the Appropriator Party shall no longer be valid if the Recycled Water, provided by the Appropriator Party to the Overlying Party, does not satisfy the requirements of Sections 13550 and 13551 and the Overlying Party ceases taking delivery of such Recycled Water.

F. Nothing in this Judgment is intended to impair or adversely affect the ability of an Overlying Party to enter into annexation or development agreements with any Appropriator Party.

G. Oak Valley Partners LP ("Oak Valley") is developing its property pursuant to Specific Plans 216 and 216A adopted by the County of Riverside ("County") in May 1990, and Specific Plan 318 adopted by the County in August, 2001, (Specific Plans 216, 216A and 318 are collectively referred to as the "Specific Plans"). The future water supply needs at build-out of the Specific Plans will greatly exceed Oak Valley's Projected Maximum Production, as reflected in Exhibit "B" to the Judgment, and may be as much as 12,811 acre feet per year. Oak Valley has annexed the portion of its property now within the City of Beaumont into the Beaumont-Cherry Valley Water District ("BCVWD"), and is in

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the process of annexing the remainder portion of its property into the Yucaipa Valley Water District ("YVWD"), in order to obtain retail water service for the development of the Oak Valley property pursuant to the Specific Plans (for purposes of this subparagraph BCVWD and YVWD are collectively referred to as the "Water Districts", and individually as a "Water District"). YVWD covenants to use its best efforts to finalize the annexation of the Oak Valley property within the Calimesa City limits. Oak Valley, for itself and its successors and assigns, hereby agrees, by this stipulation and upon final annexation of its property by YVWD, to forbear from claiming any future, unexercised, overlying rights in excess of the Projected Maximum Production of Exhibit "B" of 1806 acre feet per year. As consideration for the forbearance, the Water Districts agree to amend their respective Urban Water Management Plans ("UWMP") in 2005 as follows: BCVWD agrees that 2,400 acre feet per year of projected water demand shall be included for the portion of Oak Valley to be served by BCVWD in its UWMP, and YVWD agrees to include 8,000 acre feet per year of projected water demand as a projected demand for the portion of Oak Valley to be served by YVWD in its UWMP by 2025. The Water Districts agree to use their best judgment to accurately revise this estimate to reflect the projected water demands for the UWMP prepared in 2010. Furthermore, the Water Districts further agree that, in providing water availability assessments prior to 2010, as required by Water Code §10910 and water supply verifications as required by Government Code §§66455.3 and

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66473.7, or any similar statute, and in maintaining their respective UWMP, each shall consider the foregoing respective projected water demand figures for Oak Valley as proposed water demands. The intent of the foregoing requirements is to ensure that Oak Valley is credited for the forbearance of its overlying water rights and is fully accounted for in each Water District's UWMP and overall water planning. The Water Districts' actions in performance of the foregoing planning obligations shall not create any right or entitlement to, or priority or allocation in, any particular water supply source, capacity or facility, or any right to receive water service other than by satisfying the applicable Water District's reasonable requirements relating to application for service. Nothing in this subparagraph G is intended to affect or impair the provision of earmarked water to Overlying Parties who request and obtain water service from Appropriator Parties, as set forth in subparagraph III.3.B, above.

H. Persons who would otherwise qualify as Overlying Producers based on an interest in land lying within the City of Banning's service area shall not have the rights described in this Paragraph III.3.

4. <u>Exemption for Minimal Producers</u>

Unless otherwise ordered by the Court, Minimal Producers are exempt from the provisions of this Judgment.

IV. <u>CONTINUING JURISDICTION</u>

Full jurisdiction, power and authority is retained and reserved to the Court for purposes of enabling the Court, upon

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application of any Party, by a motion noticed for at least a 30-day period (or consistent with the review procedures of Paragraph VII.6 herein, if applicable), to make such further or supplemental order or directions as may be necessary or appropriate for interim operation of the Beaumont Basin before the Physical Solution is fully operative, or for interpretation, or enforcement or carrying out of this Judgment, and to modify, amend or amplify any of the provisions of this Judgment or to add to the provisions hereof consistent with the rights herein decreed; except that the Court's jurisdiction does not extend to the redetermination of (a) Safe Yield during the first ten years of operation of the Physical Solution, and (b) the fraction of the share of Appropriative Water of each Appropriator.

V. THE PHYSICAL SOLUTION

1. Purpose and Objective

In accordance with the mandate of Section 2 of Article X of the California Constitution, the Court hereby adopts, and orders the parties to comply with, a Physical Solution. The purpose of the Physical Solution is to establish a legal and practical means for making the maximum reasonable beneficial use of the waters of Beaumont Basin, to facilitate conjunctive utilization of surface, ground and Supplemental Waters, and to satisfy the requirements of water users having rights in, or who are dependent upon, the Beaumont Basin. Such Physical Solution requires the definition of the individual rights of all Parties within the Beaumont Basin in a manner which will fairly allocate the native water supplies and which will provide for equitable sharing of costs of Supplemental Water.

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2. <u>Need for Flexibility</u>

The Physical Solution must provide maximum flexibility and adaptability in order that the Watermaster and the Court may be free to use existing and future technological, social, institutional and economic options. To that end, the Court's retained jurisdiction shall be utilized, where appropriate, to supplement the discretion granted herein to the Watermaster.

3. <u>Production and Storage in Accordance With Judgment</u>

This Judgment, and the Physical Solution decreed herein, address all Production and Storage within the Beaumont Basin. Because the Beaumont Basin is at or near a condition of Overdraft, any Production outside the framework of this Judgment and Physical Solution will potentially damage the Beaumont Basin, injure the rights of all Parties, result in the waste of water and interfere with the Physical Solution. The Watermaster shall bring an action or a motion to enjoin any Production that is not in accordance with the terms of this Judgment.

4. <u>General Pattern of Operation</u>

One fundamental premise of the adjudication is that all Producers shall be allowed to pump sufficient water from the Beaumont Basin to meet their respective requirements. Another fundamental premise of the adjudication is that Overlying Parties who pump no more than the amount of their Overlying Water Right as shown on Column 4 of Exhibit "B" hereto, shall not be charged for the replenishment of the Beaumont Basin. To the extent that pumping exceeds five (5) times the share of the Safe Yield assigned to an Overlying Party (Column 4 of Exhibit "B") in any five (5) consecutive years, or the share of Operating Yield

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Right of each Appropriator Party, each such Party shall provide funds to enable the Watermaster to replace such Overproduction.

5. <u>Use of Available Groundwater Storage Capacity</u>

A. There exists in the Beaumont Basin a substantial amount of available Groundwater Storage Capacity. Such Capacity can be reasonably used for Stored Water and Conjunctive Use and may be used subject to Watermaster regulation to prevent injury to existing Overlying and Appropriative water rights, to prevent the waste of water, and to protect the right to the use of Supplemental Water in storage and Safe Yield of the Beaumont Basin.

B. There shall be reserved for Conjunctive Use a minimum of 200,000 acre feet of Groundwater Storage Capacity in the Beaumont Basin provided that such amount may be reduced as necessary to prevent injury to existing water rights or existing uses of water within the Basin, and to prevent the waste of water. Any Person may make reasonable beneficial use of the Groundwater Storage Capacity for storage of Supplemental Water; provided, however, that no such use shall be made except pursuant to a written Groundwater Storage Agreement with the Watermaster. The allocation and use of Groundwater Storage Capacity shall have priority and preference for Producers within the Beaumont Basin over storage for export. The Watermaster may, from time-to-time, redetermine the available Groundwater Storage Capacity.

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VI. ADMINISTRATION

1. Administration and Enforcement by Watermaster

The Watermaster shall administer and enforce the provisions of this Judgment and any subsequent order or instructions of the Court.

2. Watermaster Control

The Watermaster is hereby granted discretionary powers to develop and implement a groundwater management plan and program for the Beaumont Basin, which plan shall be filed with and shall be subject to review and approval by, the Court, and which may include water quantity and quality considerations and shall reflect the provisions of this Judgment. Except for the exercise by Overlying Parties of their respective Rights described in Column 4 of Exhibit "B" hereto in accordance with the provisions of the Physical Solution, groundwater extractions and the replenishment thereof, and the storage of Supplemental Water, shall be subject to procedures established and administered by the Watermaster. Such procedures shall be subject to review by the Court upon motion by any Party.

3. Watermaster Standard of Performance

The Watermaster shall, in carrying out its duties and responsibilities herein, act in an impartial manner without favor or prejudice to any Party or purpose of use.

4. Watermaster Appointment

The Watermaster shall consist of a committee composed of persons nominated by the City of Banning, the City of Beaumont, the Beaumont-Cherry Valley Water District, the South Mesa Mutual Water Company and the Yucaipa Valley Water District, each of which shall have the right to nominate one representative to the Watermaster committee who shall be an employee of or consultant to the nominating agency. Each such nomination shall be made in writing, served upon the other parties to this Judgment and filed with the Court, which shall approve or reject such nomination. Each Watermaster representative shall serve until a replacement nominee is approved by the Court. The nominating agency shall have the right to nominate that representative's successor.

5. Powers and Duties of the Watermaster

Subject to the continuing supervision and control of the Court, the Watermaster shall have and may exercise the following express powers, and shall perform the following duties, together with any specific powers, authority, and duties granted or imposed elsewhere in this Judgment or hereafter ordered or authorized by the Court in the exercise of its continuing jurisdiction:

A. Rules and Regulations: The adoption of appropriate rules and regulations for the conduct of Watermaster affairs, copies of which shall be provided to all interested parties.

B. Wellhead Protection and Recharge: The identification and management of wellhead protection areas and recharge areas.

C. Well Abandonment: The administration of a well abandonment and well destruction program.

D. Well Construction: The development of minimum well construction specifications and the permitting of new wells.

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E. <u>Mitigation of Overdraft</u>: The mitigation of conditions of uncontrolled overdraft.

F. <u>Replenishment</u>: The acquisition and recharge of Supplemental Water.

G. <u>Monitoring</u>: The monitoring of groundwater levels, ground levels, storage, and water quality.

H. <u>Conjunctive Use</u>: The development and management of conjunctive-use programs.

I. <u>Local Projects</u>: The coordination of construction and operation, by local agencies, of recharge, storage, conservation, water recycling, extraction projects and any water resource management activity within or impacting the Beaumont Basin.

J. <u>Land Use Plans</u>: The review of land use plans and coordination with land use planning agencies to mitigate or eliminate activities that create a reasonable risk of groundwater contamination.

K. <u>Acquisition of Facilities</u>: The purchase, lease and acquisition of all necessary real and personal property, including facilities and equipment.

L. <u>Employment of Experts and Agents</u>: The employment or retention of such technical, clerical, administrative, engineering, accounting, legal or other specialized personnel and consultants as may be deemed appropriate. The Watermaster shall maintain records allocating the cost of such services as well as all other expenses of Watermaster administration.

M. <u>Measuring Devices</u>: Except as otherwise provided

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by agreement the Watermaster shall install and maintain in good operating condition, at the cost of the Watermaster, such necessary measuring devices or meters as Watermaster may deem appropriate. Such devices shall be inspected and tested as deemed necessary by the Watermaster and the cost thereof borne by the Watermaster. Meter repair and retesting will be a Producer expense.

N. Assessments: The Watermaster is empowered to levy and collect the following assessments:

(1) Annual Replenishment Assessments

The Watermaster shall levy and collect assessments in each year, in amounts sufficient to purchase replenishment water to replace Overproduction by any Party.

(2) Annual Administrative Assessments

a. Watermaster Expenses: The expenses of administration of the Physical Solution shall be categorized as either "General Watermaster Administration Expenses", or "Special Project Expenses".

i. General Watermaster Administration Expenses: shall include office rent, labor, supplies, office equipment, incidental expenses and general overhead. General Watermaster Administration Expenses shall be assessed by the Watermaster equally against the Appropriators who have appointed representatives to the Watermaster.

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ii. Special Project Expenses: shall include special engineering, economic or other studies, litigation expenses, meter testing or other major operating expenses. Each such project shall be assigned a task order number and shall be separately budgeted and accounted for. Special Project Expenses shall be allocated to the Appropriators, or portion thereof, on the basis of benefit.

O. Investment of Funds; Borrowing: The Watermaster may hold and invest Watermaster funds as authorized by law, and may borrow, from time-to-time, amounts not exceeding annual receipts.

P. Contracts: The Watermaster may enter into contracts for the performance of any of its powers.

Q. Cooperation With Other Agencies: The Watermaster may act jointly or cooperate with other local, state and federal agencies.

R. Studies: The Watermaster may undertake relevant studies of hydrologic conditions and operating aspects of the management program for the Beaumont Basin.

S. Groundwater Storage Agreements: The Watermaster shall adopt uniform rules and a standard form of agreement for the storage of Supplemental Water, provided that the activities undertaken pursuant to such agreements do not injure any Party.

T. Administration of Groundwater Storage Capacity: Except for the exercise by the Overlying Parties of their

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respective Overlying Water Rights described in Part III, above, in accordance with the provisions of the Physical Solution, all Groundwater Storage Capacity in the Beaumont Basin shall be subject to the Watermaster's rules and regulations, which regulations shall ensure that sufficient storage capacity shall be reserved for local projects. Any Person or entity may apply to the Watermaster to store water in the Beaumont Basin.

U. Accounting for Stored Water: The Watermaster shall calculate additions, extractions and losses and maintain an annual account of all stored water in the Beaumont Basin, and any losses of water supplies or Safe Yield resulting from such stored water.

V. Accounting for New Yield: Recharge of the Beaumont Basin with New Yield water shall be credited to the Party that creates the New Yield. The Watermaster shall make an independent scientific assessment of the estimated New Yield created by each proposed project. New Yield will be allocated on an annual basis, based upon monitoring data and review by the Watermaster.

W. Accounting for Acquisitions of Water Rights: The Watermaster shall maintain an accounting of acquisitions by Appropriators of water otherwise subject to Overlying Water Rights as the result of the provision of water service thereto by an Appropriator.

X. Annual Administrative Budget: The Watermaster shall prepare an annual administrative budget for public review, and shall hold a public hearing on each such budget

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prior to adoption. The budget shall be prepared in sufficient detail so as to make a proper allocation of the expenses and receipts. Expenditures within budgeted items may thereafter be made by the Watermaster as a matter of course.

Y. Redetermining the Safe Yield: The Safe Yield of the Beaumont Basin shall be redetermined at least every 10 years beginning 10 years after the date of entry of this Judgment.

Feb 4, 20
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6. Reports and Accounting

(a) Production Reports: Each Pumper shall periodically file, pursuant to Watermaster rules and regulations, a report showing the total production of such Pumper from each well during the preceding report period, and such additional information as the Watermaster may reasonably require.

(b) Watermaster Report and Accounting: The Watermaster shall prepare an annual report of the preceding year's operations, which shall include an audit of all assessments and Watermaster expenditures.

7. Replenishment

Supplemental Water may be obtained by the Watermaster from any source. The Watermaster shall seek the best available quality of Supplemental Water at the most reasonable cost for recharge in the Basin. Sources may include, but are not limited to:

(a) Recycled Water;

(b) State Water Project Water;

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(c) Other imported water.

Replenishment may be accomplished by any reasonable method including:

(a) Spreading and percolation, or injection of water in existing or new facilities; and/or

(b) In-lieu deliveries for direct surface use, in lieu of groundwater extraction.

VII. MISCELLANEOUS PROVISIONS

1. Designation of Address for Notice and Service

Each Party shall designate, in writing to the plaintiff, the name and address to be used for purposes of all subsequent notices and service herein, such designation to be delivered to the plaintiff within 30 days after the Judgment has been entered. The plaintiff shall, within 45 days after judgment has been entered, file the list of designees with the Court and serve the same on the Watermaster and all Parties. Such designation may be changed from time-to-time by filing a written notice of such change with the Watermaster. Any Party desiring to be relieved of receiving notices of Watermaster activity may file a waiver of notice on a form to be provided by the Watermaster. The Watermaster shall maintain, at all times, a current list of Parties to whom notices are to be sent and their addresses for purposes of service. The Watermaster shall also maintain a full current list of names and addresses of all Parties or their successors, as filed herein. Copies of such lists shall be available to any Person. If no designation is made, a Party's designee shall be deemed to be, in order of priority: (i) the Party's attorney of record; or (ii) if the Party does not have an

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attorney of record, the Party itself at the address on the Watermaster list.

2. Intervention After Judgment

Any Person who is neither a Party to this Judgment nor a successor or assignee of a Party to this Judgment may seek to become a party to this Judgment by filing a petition in intervention.

3. Interference with Pumping

Nothing in this judgment shall be deemed to prevent any party from seeking judicial relief against any other party whose pumping activities constitute an unreasonable interference with the complaining party's ability to extract groundwater.

4. Successors and Assigns

This Judgment and all provisions herein shall be binding on and shall inure to the benefit of the heirs, executors, administrators, successors and assigns of the parties hereto.

5. Severability

The provisions of this Judgment are severable. If any provision of this Judgment is held by the Court to be illegal, invalid or unenforceable, that provision shall be excised from the Judgment. The remainder of the terms of the Judgment shall remain in full force and effect and shall in no way be affected, impaired or invalidated by such excision. This Judgment shall be reformed to add, in lieu of the excised provision, a provision as similar in terms to the excised provision as may be possible and be legal, valid and enforceable.

6. Review Procedures

Any action, decision, rule or procedure of the Watermaster pursuant to this Judgment shall be subject to review by the Court on its own motion or on timely motion by any Party, as follows:

A. Effective Date of Watermaster Action: Any order, decision or action of the Watermaster pursuant to this Judgment on noticed specific agenda items shall be deemed to have occurred on the date of the order, decision or action.

B. Notice of Motion: Any Party may, by a regularly-noticed motion, petition the Court for review of the Watermaster's action or decision pursuant to this Judgment. The motion shall be deemed to be filed when a copy, conformed as filed with the Court, has been delivered to the Watermaster, together with the service fee established by the Watermaster sufficient to cover the cost to photocopy and mail the motion to each Party. The Watermaster shall prepare copies and mail a copy of the motion to each Party or its designee according to the official service list which shall be maintained by the Watermaster according to Part VII, paragraph 1, above. A Party's obligation to serve the notice of a motion upon the Parties is deemed to be satisfied by filing the motion as provided herein. Unless ordered by the Court, any petition shall not operate to stay the effect of any Watermaster action or decision which is challenged.

C. Time for Motion: A motion to review any Watermaster action or decision shall be filed within 90 days after such Watermaster action or decision, except that motions to review Watermaster assessments hereunder shall be filed within 30 days of mailing of notice of the assessment.

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D. De Novo Nature of Proceeding: Upon filing of a petition to review a Watermaster action, the Watermaster shall notify the Parties of a date when the Court will take evidence and hear argument. The Court's review shall be de novo and the Watermaster decision or action shall have no evidentiary weight in such proceeding.

E. Decision: The decision of the Court in such proceedings shall be an appealable Supplemental Order in this case. When the same is final, it shall be binding upon the Watermaster and the Parties.

Dated: FEB - 4 2004

GARY TRANBARGER

JUDGE OF THE SUPERIOR COURT

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Exhibit B
Overlying Owners and Their Water Rights

(1) Producer	(2) Average Production during 1997-2001 (acre-ft/yr)	(3) Exercised Rights[1] (acre-ft/yr)	(4) Projected Maximum Production (acre-ft/yr)
Beckman, Walt	0	0	75
Roman Catholic Bishop of San Bernardino	104	114	154
Rancho Calimesa Mobile Home Park	60	150	150
Riedman, Fred L. and Richard M.	540	550	550
Sunny-Cal Egg and Poultry Company[2]	1,340	1,340	1,784
California Oak Valley Golf and Resort LLC	692	950	950
Leonard Stearn	0	0	200
Oak Valley Partners	510	553	1,806
So. California Professional Golf Association	680	1,688	2,200
Sharondale Mesa Owners Association	184	200	200
Plantation on the Lake	271	300	581
Totals	4,381	5,845	8,650

Note 1 -- Maximum Reported Production during 1997-2001

Note 2 -- The *Exercised Right* and *Project Maximum Production* are an aggregate right for defendents *Sunny-Cal Egg and Poultry*, and *Manheim, Manheim and Berman*

Exhibit C
Appropriators and Their Water Rights

(1) Producer	(2) Average Production during 1997-2001 (acre-ft/yr)	(3) Share of Safe Yield Allocated to Appropriators	(4) Initial Estimate of Appropriate Rights[1] (acre-ft/yr)	(5) Controlled Overdraft and Supplemental Water Recharge Allocation[2] (acre-ft/yr)	(6) Operating Yield (acre-ft/yr)
Banning, City of	2,170	31.43%	882	5,029	5,910
City of Beaumont	0	0.00%	0	0	0
Beaumont Cherry Valley Water District	2,936	42.51%	1,193	6,802	7,995
South Mesa Water Company	862	12.48%	350	1,996	2,346
Yucaipa Valley Water District	938	13.58%	381	2,173	2,554
Totals	6,906	100.00%	2,805	16,000	18,805

Note 1 -- Based on a 8,650 acre-ft/yr safe yield

Note 2-- Controlled overdraft will not exceed 160,000 acre-ft during for first ten years of operation under the physical solution.

Exhibit D

Legal Description of Lands of the Overlying Parties[1]

(1) Overlying Producer	(3) Assessors Parcel Number(s)	(4) Area (Acres)
Beckman, Walt	405250004	19.04
	405250005	19.00
Total Area		38.04
California Oak Valley Golf and Resort	406070041	209.71
Total Area		209.71
Manheim, Manheim & Berman[2]	407200009	20.35
	407200011	20.00
	407200012	20.04
	407210001	45.41
	407210002	12.04
	407210004	4.16
Total Area		122.00
Roman Catholic Bishop of San Bernardino	413280016	16.78
	413280030	2.06
	413280036	12.42
Total Area		31.26
Oak Valley Partners	406060010	115.82
	406060015	4.00
	406060017	19.03
	406230020	4.26
	411210003	2.40
	411210005	105.41
	411210010	15.14
	411210016	9.77
	411210017	8.94
	413030011	315.30
	413040001	493.40
	413040002	137.00
	413040003	74.48

Exhibit D

Legal Description of Lands of the Overlying Parties[1]

(1) Overlying Producer	(3) Assessors Parcel Number(s)	(4) Area (Acres)
	413040004	6.50
	413040005	80.02
	413040006	75.54
	413040007	76.22
	413040008	144.48
	413040009	10.00
	413040010	78.22
	413060003	1.70
	413160003	80.00
	413160004	106.92
	413160005	53.08
	413160006	64.47
	413160007	15.53
	413170020	40.26
	413170021	27.62
	413170023	12.38
	413170027	14.19
	413170028	4.11
	413170029	2.35
	413170030	20.28
	413170031	66.63
	413170033	2.79
	413170035	11.74
	413180017	556.91
	413180019	9.77
	413190001	111.31
	413190003	5.64
	413190005	10.35
	413190008	12.40
	413190011	138.92
	413200002	0.23
	413200003	0.15
	413200010	5.94
	413200014	10.61
	413200015	11.36
	413200020	5.00
	413200023	14.47

Exhibit D

Legal Description of Lands of the Overlying Parties[1]

(1) Overlying Producer	(3) Assessors Parcel Number(s)	(4) Area (Acres)
	413200024	5.00
	413200026	32.86
	413200027	42.90
	413200028	116.62
	413200029	6.39
	413200030	19.01
	413200034	2.18
	413200035	10.99
	413200036	10.42
	413200037	4.95
	413270021	0.31
	413280034	2.37
	413280039	13.61
	413280040	1.91
	413280041	2.24
	413280042	6.86
	413290003	510.57
	413290004	16.08
	413290006	8.40
	413290007	103.68
	413450019	74.85
	413450020	169.96
	413450021	146.99
	413450024	48.25
	413450025	50.83
	413450026	122.59
	413450029	108.92
	413460036	199.12
	413460037	23.51
	413460038	19.58
	413460039	45.23
	413460039	45.23
	414090005	1.59
	414090007	1.38
	414090013	31.60
	414090017	20.00
	414090018	4.50
	414100002	42.13
	414100003	65.00
Total Area		5,331.65

Exhibit D

Legal Description of Lands of the Overlying Parties[1]

(1) Overlying Producer	(3) Assessors Parcel Number(s)	(4) Area (Acres)
Plantation on the Lake	407230031	12.36
	407230010	1.25
	406050018	156.85
	406050002	5.12
	406050003	1.81
Total Area		177.39
Rancho Calimesa Mobile Home Park	413270001	29.66
Total Area		29.66
Merlin Properties, LLC.	407230014	48.52
Total Area		48.52
Sharondale Mesa Owners Association	413330014	1.55
	413330015	2.14
	413331022	0.48
	413331035	0.22
	413340021	0.04
	413340022	0.04
	413340023	1.53
	413340024	2.52
	413341033	0.29
	413341034	0.81
	413341036	0.35
	413342004	0.35
	413350011	1.04
	413350012	1.44
	413351018	17.08
	413351019	0.16
	413360032	1.92
	413360033	2.30
	413360035	0.90
	413361001	0.14
	413361008	0.12
	413361010	0.18
	413370027	0.39
	413370028	5.34
	413370030	0.69

Exhibit D
Legal Description of Lands of the Overlying Parties[1]

(1) Overlying Producer	(3) Assessors Parcel Number(s)	(4) Area (Acres)
	413371018	2.07
	413372019	1.39
Total Area		45.48
So. California Professional Golf Association	406060011	146.59
	406060013	2.83
	406060014	4.58
	406060016	10.35
	413450016	99.66
	413450022	95.15
	413450023	2.89
	413450027	91.53
Total Area		453.58
Stearns, Leonard	413221001	0.25
	413221002	0.34
	413260018	49.33
	413260025	0.37
	413270007	10.58
	413280010	1.27
	413280018	9.37
	413280021	4.26
	413280027	3.80
	413280037	14.32
Total Area		93.89
Sunny-Cal Egg and Poultry Company[2]	406080013	0.07
	407180004	9.35
	407190013	2.01
	407190014	0.50
	407190015	1.35
	407190016	4.95
	407190017	31.32
	407190018	0.93
	407230022	20.03
	407230023	20.03
	407230024	20.03
	407230025	21.99
	407230026	25.94

Exhibit D

Legal Description of Lands of the Overlying Parties[1]

(1) Overlying Producer	(3) Assessors Parcel Number(s)	(4) Area (Acres)
	407230027	21.63
	407230028	21.56
Total Area		201.69
Total Area for All Overlying Producers[3]		**6,782.87**

Note 1 -- Parcels as of June 1, 2003

Note 2 -- Parcels owned by Sunny-Cal Egg & Poultry Company include the overlying water rights of Manheim, Manheim and Berman and is aggregated as shown in Column 4 of Exhibit B as attributable to Sunny-Cal Egg & Poultry Company

Note 3 -- The Watermaster shall recognize adjustments in parcel boundaries that result in de minimus changes in water use

APPENDIX H

City of Banning Recycled Water Master Plan

GEOSCIENCE

City of Banning

Recycled Water Master Plan

FINAL
September 2006

carollo engineers

199 SOUTH LOS ROBLES AVENUE, SUITE 530 • PASADENA, CALIFORNIA 91101 •(626) 535-0180 •FAX (626) 535-0185

CITY OF BANNING

RECYCLED WATER MASTER PLAN

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APPENDICES

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LIST OF ABBREVIATIONS

Abbreviation	Description
ac-ft/yr	acre-feet per year
ADD	Average Day Demand
cf	Cubic feet
Carollo	Carollo Engineers
City	City of Banning
CIP	Capital improvement program
DIP	Ductile Iron Pipe
du/ac	Dwelling unit per acre
EIR	Environmental Impact Report
ET	evapotranspiration
ft/s	feet per second
ft/kft	feet per thousand feet
ft/yr	feet per year
gal	gallon
gpd/ac	Gallons per day per acre
HGL	Hydraulic Grade Line
I-10	Interstate 10
MDD	Maximum Day Demand
mgd	million gallons per day
mi	mile
MCL	Maximum Contaminant Level
MMD	Maximum Month Demand
msl	mean sea level
MWDSC	Metropolitan Water District of Southern California
PHD	Peak Hour Demand
PSs	Pump Stations
sf	square feet
SWP	State Water Project
USD	Unified School District
VFD	Variable Frequency Drive
WDF	Water Demand Factor
WWTP	Wastewater Treatment Plant
Zone	Pressure Zone

1.0 INTRODUCTION

1.1 Authorization

This report has been prepared in accordance with the consulting engineering agreement for the water, sewer, and recycled water master plan update project between the City of Banning (City) and Carollo Engineers (Carollo), dated March 14, 2006. This report represents the findings of the work conducted for Task C (Water Reuse Master Plan Update). The findings of tasks A (Water Master Plan Update) and Task B (Sewer Master Plan Update) are presented in separate reports.

1.2 Purpose and Objectives

1.2.1 Purpose

The purpose of this Recycled Water Master Plan is to define the capital improvements required to serve recycled water customers where feasible in the City of Banning (City).

1.2.2 Objectives

The objectives of this Recycled Water Master Plan are:

1. Identify the potential recycled water customers and their demands in the City.
2. Define planning and evaluation criteria for the recycled water distribution system.
3. Size and optimize the location of the recycled water distribution system pipelines and facilities.
4. Prepare a capital improvement program including phasing and cost estimates for the proposed recycled water system.

1.3 Background

The City recognized a need to provide irrigation water to customers in 1991, when the City conducted a study to evaluate the feasibility of constructing an irrigation water system [1]. At that time, the City had been experiencing a high growth rate and irrigation water demands had increased substantially due to completion of the Sun Lakes Development, a planned residential community with golf courses. Other major irrigation water users were identified as well, such as municipal parks, industrial and commercial areas, and freeway landscaping. Due to economic feasibility constraints, the irrigation water system has not been developed yet.

During the last decade, the City has experienced an increased level of land use planning activities that will result in increased water demands and water supply cost. Five new residential developments that are currently being planned within City's service area will further increase the City's water supply needs. These developments are:

- Five Bridges Project by Lennar
- Pardee Project by Pardee Homes
- Black Bench Project by SunCal Companies
- Loma Linda Project (Banning Bench)
- BDS Project south of I-10

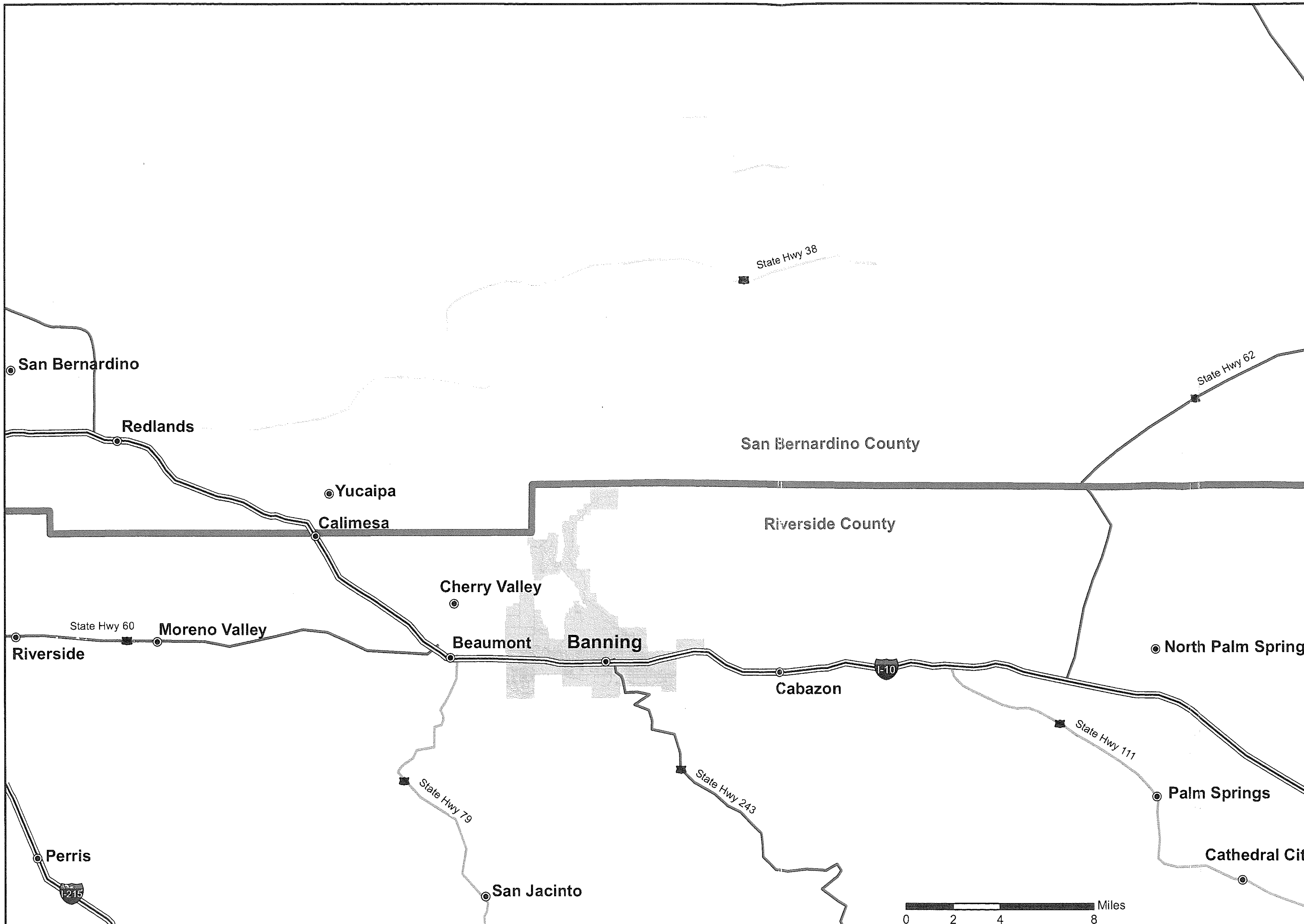
These developments are depicted on Figure 2.1. The City understands the need for a recycled water distribution system to supply irrigation water to these proposed projects to reduce the increase in potable water supply needs. The recycled water system for these new developments will also provide opportunities to convert some existing large volume users potable water customers to recycled water. By providing recycled water for landscape irrigation, limited groundwater supplies can be dedicated to domestic uses.

1.3.1 Previous Studies

CM Engineering Associates, Inc. completed a report titled "*Irrigation Water Project Feasibility Study*" [1] in July 1991 that evaluated the feasibility of constructing an irrigation water system using the City's existing Well R-1 and treated wastewater from the City's wastewater treatment plant to serve the Sun Lakes' golf course, Interstate 10 freeway landscapes, municipal parks, and other industrial/ commercial areas. The report concluded that a water main along Lincoln Street could deliver irrigation water to the Sun Lakes golf course and other identified landscaped areas south of Interstate 10. A preliminary cost estimate was prepared for the proposed irrigation water system, including pipelines, pumping and storage facilities. Estimates for the upgrade to the City's wastewater treatment plant to tertiary treatment were not provided.

Montgomery Watson Harza (MWH) completed a report titled "*Irrigation Water Feasibility Study*" [2] in January 2003 that updated the cost estimates contained in the 1991 CM Engineering Associates report. The MWH report also included some preliminary cost estimating for upgrading the City's wastewater treatment plant to tertiary treatment.

In addition, MWH completed a draft report titled "*Update of the Banning Wastewater Treatment Facility Expansion*" [3] in March 2006 that evaluated process alternatives for the phased expansion of the treatment plant to produce recycled water of acceptable quality for landscape irrigation and other uses.



BANNING, CA
STAGECOACH TOWN USA
ESTABLISHED 1913

Figure 1.1 - Vicinity Map and Study Area

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City of Banning, CA - Recycled Water Master Plan

August 2006

The "*Water Master Plan Update*" [4] prepared by NBS Lowry and Associates in 1994, did not consider the use of recycled water for irrigation purposes, and all system analysis and all recommended improvements were based on potable water supply only.

A "*Water System Hydraulic Modeling Report*"[19], prepared by MWH in May 2002, updated the City's Water Master Plan but did not consider the use of recycled water. A subsequent update of the City's water system model is in progress by MWH.

Wildermuth Environmental Inc. prepared the City's "*2005 Urban Water Management Plan*" [5], which identified that the recycled water production was about twice the potential recycled water demand in 2005, and continues to increase at a much higher rate than the recycled water demand. It also mentioned the need for the wastewater treatment plant upgrade to meet Title 22 tertiary treatment standards.

1.4 Study Area

The study area of this recycled water master plan includes the area within the existing city limits. The City is located in the northwest portion of Riverside County and is situated along Interstate 10 approximately 30 east of the City of Riverside and 25 miles west of Palm Springs. The study area is shown on Figure 1.1.

The City encompasses approximately 25 square miles and has a current population of approximately 29,000. Approximately 8 square miles or 32 percent of the City's service area is currently developed. The City is growing rapidly and has an estimated build-out population of nearly 100,000. The five near-term developments as indicated on Figure 2.1 have a combined area of nearly 4 square miles and are projected to increase the City's population by 31,000 to 60,000. Hence, the City's population is projected to continue to growth significantly after the completion of these developments.

1.5 Scope of Work

The scope of work for this Recycled Water Master Plan Update consists of the following tasks:

1) Data Collection and Review
2) Recycled Water Supply and Demand Assessment
3) Database Creation and Population
4) Supply and Production Demand Curves
5) Recycled Water Model and Distribution System

1.6 Acknowledgements

Carollo Engineers wishes to acknowledge and thank all of the City's staff for their support and assistance in completing this project. Special thanks go to Paul Toor (Public Utilities Director), George Thacker (Assistant Director for Water and Wastewater Utility), John Holub (Operations and Maintenance Technician), and Jerry Aguilar (GIS Manager).

1.7 Project Staff

The following Carollo Engineers staff members were principally involved in this project:

David Prasifka, P.E.	: Partner-In-Charge
Dennis Wood, P.E.	: Technical Review
Jonathan Howard, P.E.	: Technical Review
Inge Wiersema, P.E.	: Project Engineer/Project Manager
Dan Aruta, P.E.	: Staff Engineer
Chris Graf	: Staff Engineer
Coleen Sullivan	: Technical Staff/GIS

2.0 LAND USE AND RECYCLED WATER DEMANDS

This Section describes the City's land use and the estimated recycled water demands, which are based upon the City's land use plans. The land use discussion is divided into existing land use, specific plan land use for the near-term developments, and general plan land use for the City's ultimate land use. The recycled water demand discussion is divided into water demand factors, peaking factors, potential customers, and concludes with a recycled water demand summary.

2.1 Land Use

The existing, near-term, and build out land use types in the City described in this Section are based on the City's General Plan [6] , parcel information [7], aerial photography [8], and the specific plans for Five Bridges [9], Pardee [10], Black Bench [11], Loma Linda [12], and BDS [13]. The land use designations that are described in these documents are summarized below.

- ✓ **Residential - Rural.** This land use category includes all residential designations that have a density of 0-1 dwelling units per acre (du/ac).
- ✓ **Residential - Very Low Density.** This land use category includes all residential designations that have a density of 1-2 dwelling units per acre (du/ac). Based on this definition, this category includes the following land use designations: Very Low Density Residential [6]; Residential [13]; and PA-12, PA-13, and PA-15 [11].
- ✓ **Residential - Low Density.** This land use category includes all residential designations that have a density of 2-5 dwelling units per acre (du/ac). Based on this definition, this category includes the following land use designations: Low Density Residential [6], PA-1 through PA-11, PA-14, and PA-16 through PA-18 [11]; Minimum residential area of 6,000 square foot and greater [9]; Residential Areas 4, 8, 18, 24, 31, 33, 46, 47, 52, 53, 60, and 61 [10]; and Residential Areas 1, 3, 4, and 5 [12].
- ✓ **Residential - Medium Density.** This land use category includes all residential designations that have a density of 5-9 dwelling units per acre (du/ac). Based on this definition, this category includes the following land use designations:
- ✓ **Residential - High Density.** This land use category includes all residential designations that have a density of 9-20 dwelling units per acre (du/ac). Based on this definition, this category includes the following land use designations:
- ✓ **Commercial.** This land use category includes markets, service stations, restaurants, office buildings, hospitals, car washes, and other commercial service establishments.

- ✓ **Industrial.** This land use category includes all service industry and manufacturing establishments. This City does not include any heavy industry or water intensive industrial customers.

- ✓ **Public.** This land use category includes various types of public facilities, such as schools, libraries, office buildings, parking structures, and recreational areas. The (recycled) water demand in this category varies greatly.

- ✓ **Streets and Right-of-Way.** This land use category includes all major streets, flood control channels, powerline easements, and freeway right-of-ways, such as Interstate 10. Small residential streets are included in the gross residential area.

- ✓ **Airport.** This category includes the airport buildings, runways, and all airport related industrial and commercial areas. These include the Airport Operations District, the Airport Clear Zone District, the Airport Facilities District, and the Airport Planned Development areas.

2.1.1 Existing Land Use

The City of Banning has approximately 4,901 acres of development area, which equals to about 21 percent of the City's service area. An aerial view of the City, that depicts the location of the existing developments [8], is shown on Figure 2.1. This figure shows that the majority of the developments are located along Interstate 10, while the non-developed areas are mostly located north of Interstate 10 and are partially covered with steep hillsides of the San Bernardino Mountains. The land use distribution of the existing developments is summarized in Table 2.1. As shown on this table, the majority (63 percent) of the developed areas are residential land use categories, while the remaining 37 percent of the developments are public, industrial, and commercial land uses.

Table 2.1 Existing Land Use Summary
Recycled Water Master Plan
City of Banning

Land Use Category	Area (acres)	Area (%)
Rural Residential	335	7%
Very Low Residential	373	8%
Low Residential	1,440	29%
Medium Residential	767	16%
High Residential	170	3%
Commercial	666	14%
Industrial	773	16%
Public	378	8%
Total	**4,901**	**100%**

City of Banning, CA
Recycled Water Master Plan

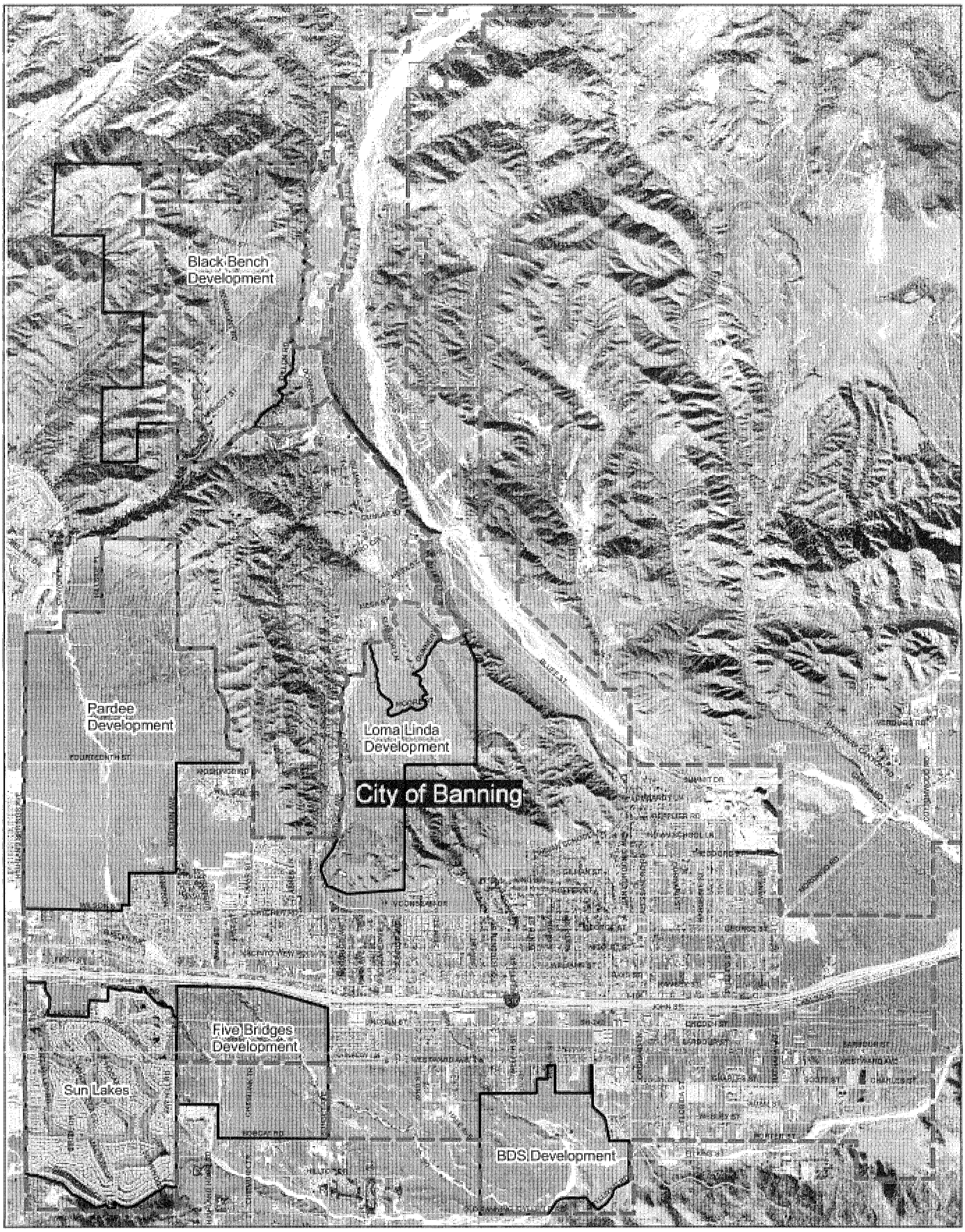

Figure 2.1 - Aerial View

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Note:

1. This map contains data from the City of Banning GIS.
2. This map is intended for display and planning purposes only.

2.1.2 Specific Plan Land Use

As mentioned in Section 1, the City has recently received five Specific Plans that describe the land use plans for proposed developments within the City boundaries. The five specific plans cover a combined area of approximately 3,270 acres, which equals approximately 14 percent of the City's service area. The developments and their respective planning areas and the distribution of the planned 10,308 dwelling units are as follows:

- ✓ Black Bench : 1,500 dwelling units
- ✓ Sunset : 2,160 dwelling units
- ✓ BDS : 481 dwelling units
- ✓ Pardee : 5,224 dwelling units
- ✓ Loma Linda : 944 dwelling units

The specific plan boundaries are depicted on Figure 2.1. The land use distribution of these five specific plans is summarized in Table 2.2, while details are included in **Appendix B**.

Table 2.2 Specific Plan Land Use Summary
Recycled Water Master Plan
City of Banning

Development/ Land Use Category	Phase 1		Build Out	
	Area (acres)	Area (%)	Area (acres)	Area (%)
Black Bench				
Very Low Residential	0	0%	104	15%
Low Residential	111	42%	387	57%
Public	o	0%	13	2%
Parks	26	10%	52	8%
Fire Modification Zone	126	48%	126	19%
Black Bench Total	**264**	**100%**	**683**	**100%**
BDS				
Very Low Residential	140	100%	372	100%
BDS Total	**140**	**100%**	**372**	**100%**
FIVE BRIDGES				
Low Residential	68	46%	204	45%
Medium Residential	39	27%	118	26%
High Residential	14	10%	43	9%
Commercial	0	0%	37	8%
Parks	26	17%	51	11%
Five Bridges Total	**147**	**100%**	**455**	**100%**

Table 2.2 Specific Plan Land Use Summary (Continued) Recycled Water Master Plan City of Banning				
Development/ Land Use Category	Phase 1		Build Out	
	Area (acres)	Area (%)	Area (acres)	Area (%)
PARDEE				
Low Residential	102	25%	389	30%
Medium Residential	31	8%	564	44%
Commercial	0	0%	36	3%
Public	5	1%	32	2%
Parks	26	6%	52	4%
Golf Course	220	54%	220	17%
Pardee Total	**409**	**100%**	**1,293**	**100%**
LOMA LINDA				
Low Residential	26	9%	79	17%
Medium Residential	36	13%	107	23%
Commercial	0	0%	12	3%
Public	0	0%	10	2%
Parks	37	13%	74	16%
Golf Course	185	65%	185	40%
Loma Linda Total	**284**	**100%**	**467**	**100%**
GRAND TOTAL	**1,243**		**3,270**	

Note: For the phasing of parks and golf courses, it is assumed that 50 percent of parks and 100 percent of golf course would be developed in Phase 1.

As listed in Table 2.2, the development of these specific plan areas is divided into two periods, Phase 1 and Build Out. Phase 1 is anticipated to be completed around year 2010, while build out conditions are projected to be reached around year 2030. The combined area of Phase 1 is approximately 1,243 acres, or 38 percent of the entire specific plans area at build out (3,270 acres).

2.1.3 General Plan

The ultimate land use for the City's service area is specified in the City's General Plan, which was adopted by City Council [6]. The City's general plan differentiates 27 land categories. For the purpose of this master plan, these categories are consolidated into ten generic land use designations, as shown on Figure 2.2. The areas of these ten land use categories are calculated from the City's GIS and are summarized in Table 2.3.

BANNING, CA
STAGECOACH TOWN USA
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City of Banning, CA
Recycled Water Master Plan

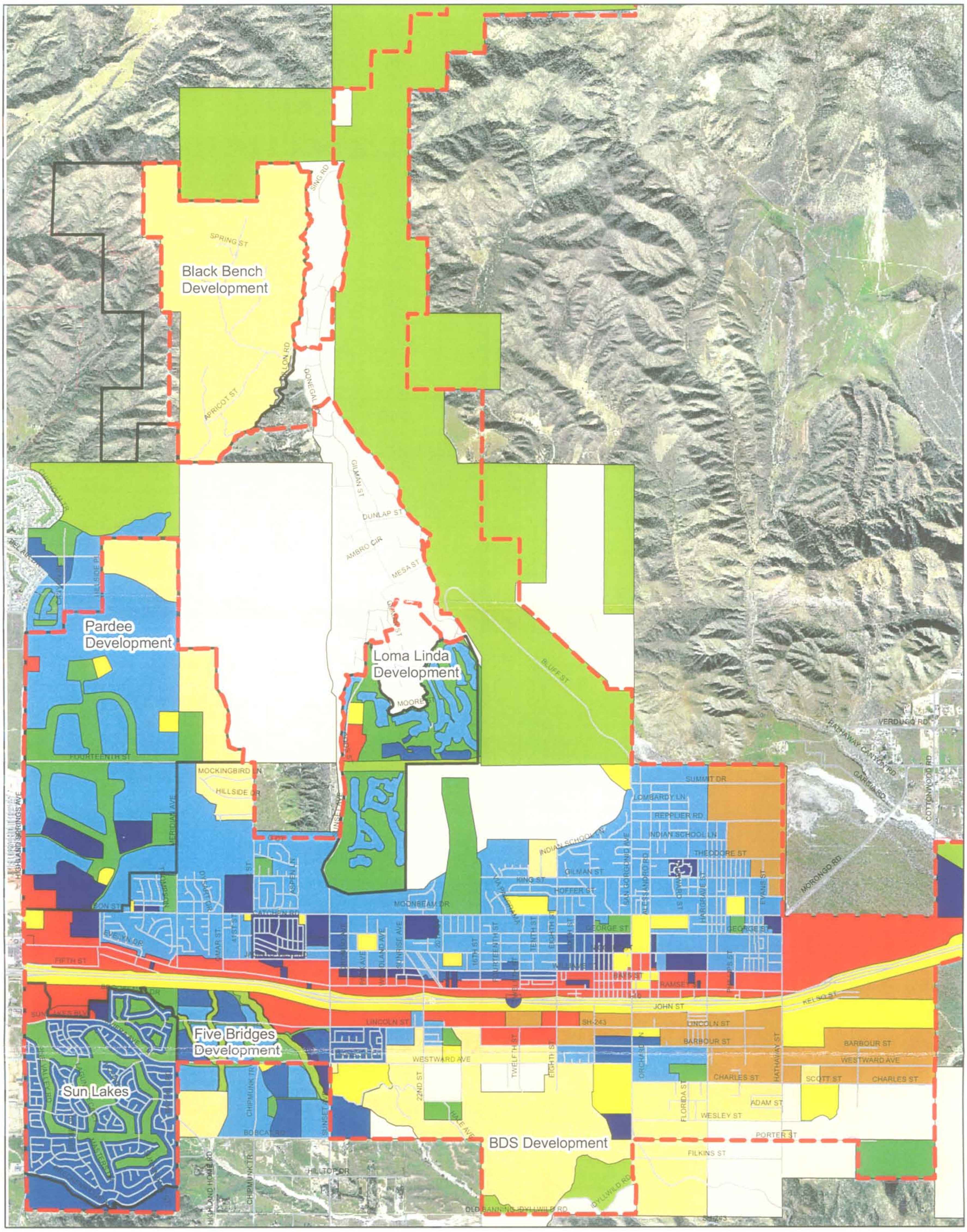

Figure 2.2 - General Plan Land Use

N

Note:
1. This map contains data from the City of Banning GIS.
2. This map is intended for display and planning purposes only.

0 1,300 2,600 5,200 Feet

General Plan Residential
- Rural (RR)
- Very Low Density (VLDR)
- Low Density (LDR)
- Medium Density (MDR)
- High Density (HDR)

Other Land Uses
- Commercial (C)
- Industrial (I)
- Public (P)
- Open Space Nature (OS-N)
- Open Space Parks (OS-Pk)

- I-10
- Streets
- City Boundary

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Table 2.3 General Plan Land Use Summary Recycled Water Master Plan City of Banning		
Land Use Category	**Area (acres)**	**Area (%)**
Rural Residential	6,759	29%
Very Low Residential	2,369	10%
Low Residential	3,385	14%
Medium Residential	1,099	5%
High Residential	510	2%
Commercial	1,090	5%
Industrial	773	3%
Public	1,061	4%
Open Space - Parks	1,292	5%
Open Space - Nature	5,288	22%
Total	**23,628**	**100%**

As shown in Table 2.3, residential land use categories cover 60 percent of the City's service area, while natural open space is the second largest land use, covering about 22 percent of the City's service area.

As shown on Figure 2.2, the majority of the areas that are not currently developed or part of the specific plans, are designated as natural open space and rural residential and cover hillsides of the San Bernardino Mountains.

2.2 Population

The City's population will increase significantly with the addition of the five new developments. The total developed area and the project population for Phase 1 and Built Out conditions are summarized in Table 2.4. This table shows that the five developments will increase the population to about 60 percent of the City's built out population, while covering only 31 percent of the City's service area. Hence, the development of the remaining areas will primarily consist of lower density land use types, such as LDR and AR. Based on 2.9 people per dwelling unit, the average density of the remaining development beyond the planning horizon of this master plan is approximately 0.9 du/ac.

Table 2.4 Population Projections Recycled Water Master Plan City of Banning				
Area Description	**Area (acres)**	**Area (%)**	**Population (ppl)**	**Population (%)**
Existing Development	4,901	21%	28,982	29%
5 Developments - Phase 1	598	3%	7,239	7%
5 Developments - Phase 2 to Build Out	1,911	8%	21,913	22%
Remaining Development	16,218	69%	41,651	42%
Total	**23,628**	**100%**	**99,785**	**100%**

2.3 Demand Estimating Parameters

The recycled water demand estimates presented in Section 2 are based on various assumptions and criteria. These factors are discussed below.

2.3.1 Irrigation Season

The amount of water required for potential landscape irrigation customers is directly dependent on precipitation and evapotranspiration. Net irrigation demand is defined as the difference between evapotranspiration (ET) and rainfall, adjusted for irrigation efficiency and leaching factors.

The following formula was used to calculate the amount of evapotranspiration from landscaped areas in Banning:

$$ET_L = K_L * ET_0$$

where:

ET_L = Evapotranspiration of landscaped areas (in inches)

K_L = Landscaped area crop coefficient

ET_0 = Reference evapotranspiration (in inches)

The estimated average monthly landscape irrigation needs based on calculated evapotranspiration and average rainfall is presented in Table 2.5. As shown in this table, the rainfall in the months of January, February, March and December exceed the evapotranspiration. Hence, these months are excluded from the irrigation season. Based on this historical data the irrigation season is defined by the eight-month annual period from April through November. It is assumed that the proposed recycled water distribution system will only operate during the defined eight-month irrigation season.

2.3.2 Demand Factors

As described in detail in Section 2, the water demand factor used in this master plan to estimate recycled water demands is 3,650 gpd/ac. Based on discussion with City staff, it is assumed that the potential recycled water use for commercial and industrial users is insignificant.

Table 2.5	Average Monthly Landscape Irrigation Needs Recycled Water Master Plan City of Banning				
	Month	ET[1] (inches)	Rainfall[2] (inches)	Irrigation Needed[3] (inches)	Irrigation Needed[4] (%)
	January	2.28	3.76	0	
	February	2.66	3.44	0	
	March	3.80	3.12	0.9	
Irrigation Season	April	4.82	1.36	4.7	10%
Irrigation Season	May	5.43	0.63	6.5	14%
Irrigation Season	June	6.00	0.16	7.9	17%
Irrigation Season	July	6.60	0.23	8.6	18%
Irrigation Season	August	6.32	0.22	8.3	17%
Irrigation Season	September	4.89	0.51	5.9	12%
Irrigation Season	October	3.70	0.60	4.2	9%
Irrigation Season	November	2.69	1.65	1.4	3%
	December	2.34	2.09	0.3	
Annual Total		**51.5**	**17.8**	**48.7**	**100%**
Irrigation Season Total		**40.5**	**5.4**	**47.5**	**100%**

Notes:

(1) Source: California Irrigation Management Information System, Average Yearly ET_0 Report, U.C. Riverside Station [16]. Adjusted for landscape irrigation coefficient, k_L.

(2) Source: Western Regional Climate Center, Station No. 040609, Beaumont, CA. 1948-2005 [17].

(3) [Evapotranspiration - Rainfall] * 1.15 / 0.85. Where 0.85 = 85% Irrigation Efficiency Factor (Average value from Carlos and Guitjens, University of Nevada) and 1.15 = 15% Leaching Fraction (Average value from Ayers and Westcot, "Water Quality for Agriculture", Food and Agriculture Organization of the United Nations).

(4) Current month net irrigation requirement divided by total net irrigation requirement.

2.3.3 Peaking Factors

The following peaking factors are used for the hydraulic analysis and sizing of the City's recycled water system:

- ✓ Maximum Month Demand (MMD) factor
- ✓ Maximum Day Demand (MDD) factor
- ✓ Peak Hour Demand (PHD) factor for 8-hr irrigation
- ✓ Peak Hour Demand (PHD) factor for 12-hr irrigation
- ✓ Peak Hour Demand (PHD) factor for 24-hr irrigation

These peaking factors are based on the following assumptions and calculations:

The MMD factor is based on the assumption that irrigation will occur during an 8-month period or 244 days, from April through November. As listed in Table 3.1, the month of July is the month with the greatest irrigation needs. Based on annual and maximum month irrigation needs, MMD peaking factor is calculated as follows:

$$\text{Maximum Month Peak Factor} = \frac{8.6 \quad \text{inches/month}}{47.5 \quad \text{inches/year}} * 12 \text{ months/year} = 2.17$$

The MDD factor is based on typical demand variation in hot summer months. Historical records from water companies in Southern California show that the MDD is approximately 20 to 30 percent higher than the MDD. As the majority of the increase is caused by an increase irrigation use, a MDD factor of 1.30 is used in this master plan.

The 8-hr PHD factor for golf courses, parks, and schools is based on an 8-hour irrigation period, which equates to a peaking factor of 3.0 (24 hours / 8 hours). Irrigation of parks and schools areas is assumed to take place between 10 PM and 6 AM. The irrigation of golf courses is assumed to take place slightly earlier, between 8 PM and 4 AM, to allow the greens to dry before golfers show up.

The 12-hr PHD factor for Caltrans irrigation is based on a 12-hour irrigation period, which equates to a peaking factor of 2.0 (24 hours / 12 hours). The irrigation of Caltrans right-of-ways is assumed to take place between 6 AM and 6 PM.

The 24-hr PHD factor for Golfcourse irrigation is based on a 24-hour constant delivery of recycled water to the golf course ponds. This delivery pattern equates to a peaking factor of 1.0 (24 hours / 24 hours).

2.4 Recycled Water Demands

The recycled water demand estimates used in this master plan are based on land use type, irrigated area, water demand factors, and peaking factors. These factors are discussed below, followed with a summary of potential recycled water customers.

2.4.1 Recycled Water Demand Factors

A water demand factor (WDF) is the estimated amount of water usage for a certain land use type. WDFs are typically expressed in gallons per day per acre (gpd/ac). These factors are used to estimate the average day demand (ADD) for existing and potential customers by multiplying the WDF with the total number of acres.

This study assumes that recycled water is only used for irrigation purposes. Recycled water demand factors used in previous studies are summarized below.

- ✓ Willdan Associates prepared a master water plan for the City in 1983 which calculated the following irrigation demands: 4,000 gallons per day per acre (gpd/ac) for industrial land use, and 3,500 gpd/ac for schools and parks [14].
- ✓ James Smith, consulting engineer, developed a master water plan for the Presley Property in the City in 1985 in which the average demand factor of 4,400 gpd/ac was used [15].
- ✓ CM Engineering Associates, compiled one year's worth of actual metered water consumption data for the Sun Lakes Development in 1991. This study calculated an average water consumption of 4,477 gpd/ac, which was very close to the Presley Master Plan design factor.
- ✓ Pardee Homes provided the City a detailed breakdown of irrigation water demands for its proposed Banning Tract development in March 2006 that used demand factors of 3,500 gpd/ac and 4,400 gpd/ac for parks and an estimated irrigation water demand for a proposed golf course that results in a demand factor of 3,683 gpd/ac.

For this project, a new irrigation water demand factor is calculated based on the local net irrigation needs. The net irrigation needs is estimated to be 4.1 ft/yr based on historical evapotranspiration and rainfall data in the City's service area. This calculation is described in detail in Section 3. The water demand factor is calculated as follows:

$$\text{Water Demand Factor} = \frac{4.1\ \text{ft/yr} * 43{,}560\ \text{sf/ac} * 7.48\ \text{gal/cf}}{365\ \text{days/yr}} = 3{,}623\ \text{gpd/ac}$$

Carollo's calculated irrigation demand factor of 3,623 gpd/ac is consistent with Pardee's golf course irrigation factor. For planning purposes, an irrigation demand factor of 3,650 gpd/ac is used to estimate the City's potential irrigation water demands in this master plan.

2.4.2 Peaking Factors

It is important to consider the variability of water demands when evaluating system hydraulics and sizing water system facilities and pipelines. Water demands vary both seasonally and hourly. Water demands are typically higher than average on hot summer days, primarily due to increased water demands for irrigation. On cool winter days, water demands are lower than average due to lower temperatures and increased precipitation, which significantly reduces irrigation demands. Peaking factors are used to account for these demand fluctuations. Peaking factors are determined by dividing the water demand for a selected period by the average day demand (ADD). In this master plan, the following two seasonal peaking factors are used:

- ✓ Maximum Month Demand (MMD) = MMD/ADD
- ✓ Maximum Day Demand (MDD) = MDD/ADD

In addition, water demands vary throughout a 24-hour period. In residential areas, demand peaks typically occur in the morning and late afternoon. Areas with automatic sprinkler systems used for irrigation typically see peak demand periods late at night through the early morning hours. An hourly water use curve, also knows as diurnal curve, is used to describe and simulate water demands throughout the day. In this master plan, the following three diurnal curves are used:

- ✓ Irrigation of Parks and School areas = 8 hours per day from 10 PM to 6 AM
- ✓ Irrigation of Golf Courses = 24 hours per day from midnight to midnight
- ✓ Irrigation of Caltrans right-of-way areas = 12 hours per day from 6 AM to 6 PM

The peaking factors used in this master plan are summarized in Table 2.6, while the assumptions and calculations of these factors are described in more detail in Section 3.

Table 2.6 Peaking Factors
Recycled Water Master Plan
City of Banning

Demand Condition	Specific Peaking Factor	Composite Peaking Factor
Average Day Demand (ADD)	-	1.00 * ADD
Maximum Month Demand (MMD)	2.17 * ADD	2.17 * ADD
Max Day Demand (MDD)	1.30 * MMD	2.82 * ADD
Peak Hour Demand (PHD)		
8 hour irrigation[1]	3.0 * MDD	8.46 * ADD
12 hour irrigation[2]	2.0 * MDD	5.64 * ADD
24 hour irrigation[3]	1.0 * MDD	2.82 * ADD

1) Schools and Parks (10 PM - 6 AM)
2) Caltrans (6 AM - 6 PM)
3) Golfcourses (0 AM-0 AM);

2.4.3 Potential Customers

It is assumed that recycled water will be treated and distributed for irrigation use only. Sufficient landscape irrigation water demand from existing and future customers is available to allow for beneficial use of the treated wastewater from the City's wastewater treatment plant or satellite plants. Areas suitable for irrigation with recycled water include golf courses, commercial and industrial planting areas, greenbelts, freeway landscaping, parks, playgrounds and schoolyards. Potential customers need to meet the following three criteria to qualify for recycled water for irrigation use:

1) Their location shall be near a recycled water distribution pipeline or in proximity of other potential customers.

2) Their ADD exceeds 10,000 gpd. Potential customers with ADD less than 10,000 gpd may be eligible if their location is near a recycled water pipeline.

3) All irrigation areas should be located within City limits.

Based on these criteria, 18 potential recycled water customers were identified. These users can be divided into two categories; 1) current potable water customers that could convert to recycled water for their irrigation needs, and 2) future customers such as parks and golf courses identified in the specific plans. The location of these potential customers are depicted on Figure 2.3, while their estimated recycled water demands are summarized in Table 2.7.

Table 2.7 Potential Recycled Water Customers and Demands
Recycled Water Master Plan
City of Banning

ID	Customer Name	Irrigation Area(1) (acres)	Demand Factor (gpd/ac)	Annual Demand (afy)	Max Day Demand (gpm)	Peak Hour Demand (gpm)
Existing Potable Water Customers						
1	Sun Lakes Development	199	4,868(2)	1,085	1,900	1,900
2	CalTrans along I-10	200	3,650	818	1,432	2,864
3	Gilman Historic Ranch	59	3,650	241	422	1,267
4	Banning High School	40	3,650	164	286	859
5	Dysart Park	20	3,650	82	143	430
6	Rehab & Counseling Center	20	3,650	82	143	430
7	Lions Park	9	3,650	37	65	195
8	Sylvan Park	8	3,650	32	56	168
9	Neighborhood Park	8	3,650	31	54	161
10	Repplier Park	7	3,650	28	49	146
11	Deutsch Company Park	5	3,650	20	36	107
12	Roosevelt Williams Park	5	3,650	19	34	102
13	Mountain Avenue Park	3	3,650	13	22	67
14	Banning Unified School District	3	3,650	12	21	64
Future Developments				2,664		
15	Loma Linda Development	259(4)	3,650	1,059	1,854	2,914
16	Pardee Development	272	3,686	1,123	1,967	2,723
17	Five Bridges Development	51	3,650	210	367	1,102
18	Black Bench	113	3,650	463	810	2,430
18	Black Bench - Fire Zone	42	1,217(3)	57	101	302
Total		**1,245**	**1,323**	2912	**5,575**	**9,763**

5576

(1) Source data: [6], [7], [8], and [18].
(2) Based on historical usage records.
(3) Based on drought tolerant vegetation (33% of turf water usage) in the first 50 foot of the 150 foot fire modification zone.
(4) This excludes the greenspace along the steep slopes in the southern portion of the development.

2.4.4 Recycled Water Demand Summary

To prioritize the potential recycled water customers, a prioritization matrix was developed to consider: 1) the potential recycled water demand, 2) the proximity to the proposed recycled water backbone system, and 3) the estimated unit cost. The unit cost, expressed in dollar per acre-ft, reflect the annual capital cost of the pipelines required to serve the customer from the backbone system assuming a 30-year useful life. The backbone system consists of the pipelines from the Banning WWTP to the two proposed reservoirs as shown on Figure 2.4. The cost of the backbone system is proportionally divided over the potential customers based on their demands.

To prioritize the connection of potential recycled water customers, a ranking scheme was developed based on the range in demand, distance to the backbone system and unit cost. The ranking criteria used are summarized in Table 2.8.

Table 2.8 Ranking Criteria
Recycled Water Master Plan
City of Banning

Ranking Criteria	Ranking 1	Ranking 2	Ranking 3
Potential Demand (acre-ft/yr)	<100	100-300	>300
Distance to Backbone System (mi)	>1.0	0.5-1.0	<0.5
Unit Cost ($/acre-ft).	>$800	$500-$800	<$500

As shown in this table, a customer is assigned a ranking of 1, 2, or 3 for each of the criteria. Hence, each customer is assigned a ranking score ranging between 3 and 9, depending on the customers demand, distance to the backbone system and unit cost. Based on the total score, the customers are divided into three priority groups:

- ✓ Priority 1: Customers with a ranking score equal or greater than 7
- ✓ Priority 2: Customers with a ranking score equal to 6
- ✓ Priority 3: Customers with a ranking score equal or less than 5

It is recommended that customers with Priority 1 be connected first, followed by customers with Priority 2 and 3, if feasible. The results of the analysis are presented in Table 2.9.

STAGECOACH TOWN USA
ESTABLISHED 1913

City of Banning
Recycled Water Master Pan

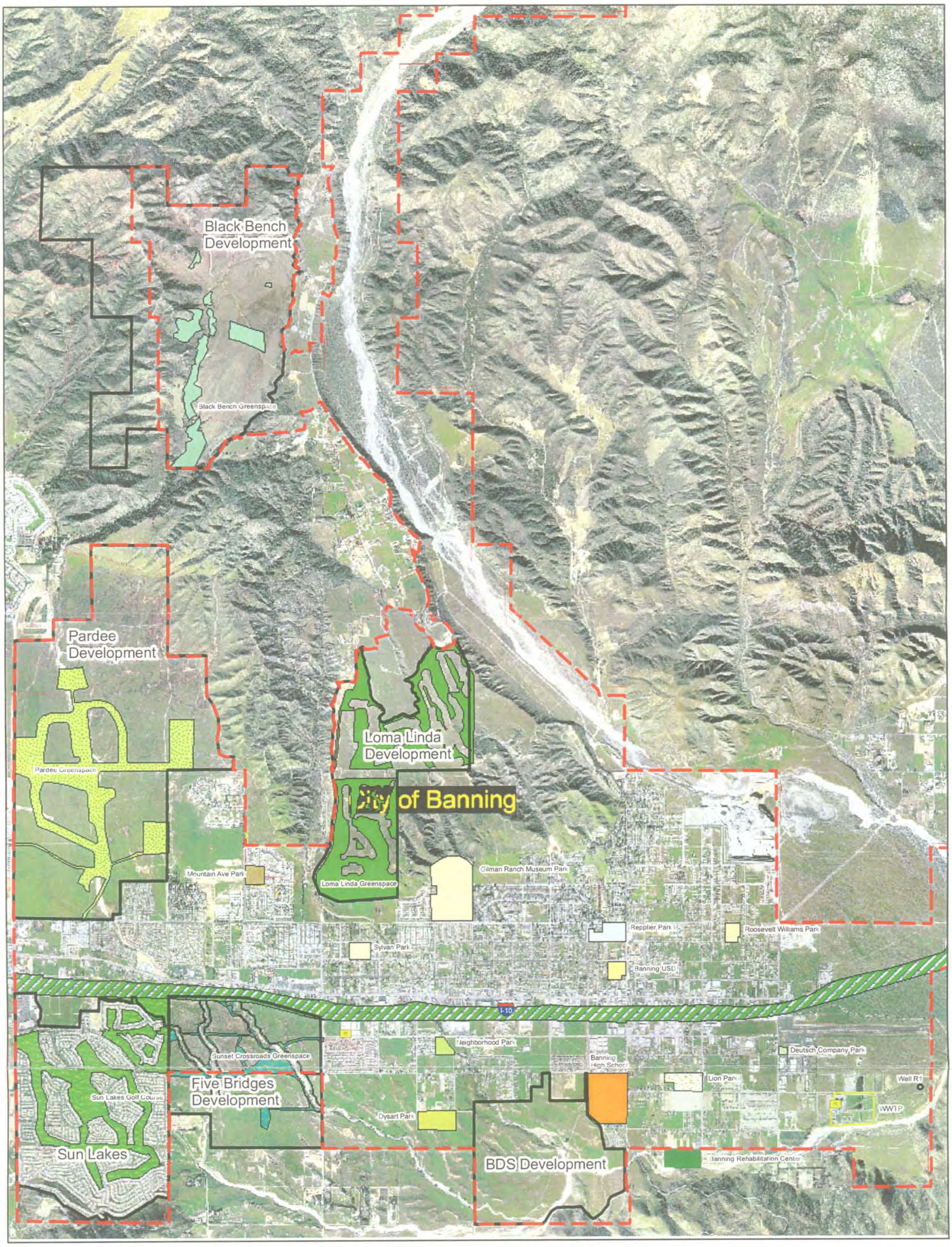

Figure 2.3 - Potential Recycled Water Customers Locations

N

Note:

1. This map contains data from the City of Banning GIS.
2. This map is intended for display and planning purposes only.

0 1,250 2,500 5,000 Feet

Legend

- CALTRANS (1)
- Gilman Ranch Museum Park (2)
- Banning High School (3)
- Dysart Park (4)
- Rehab & Counseling Center (5)
- Lions Park (6)
- Sylvan Park (7)
- Neighborhood Park (8)
- Repplier Park (9)
- Deutsch Company Park (10)
- Roosevelt Williams Park (11)
- Mountain Ave Park (12)
- Banning USD (13)
- Loma Linda Greenspace (14)
- Pardee Greenspace (15)
- Sun Lakes Golf Course (16)
- Sunset Crossroads Greenspace (17)
- Black Bench Greenspace (18)
- Pump Stations
- Well R1
- Wastewater Treatment Plant
- I-10
- City Boundary

carollo engineers

Table 2.9 Prioritization of Recycled Water Customers
Recycled Water Master Plan
City of Banning

ID	Customer Name	Demand (ac-ft/yr)	Distance to Backbone (mi)	Unit Cost ($/acre-ft)	Overall Ranking	Priority
14	Loma Linda Development	1,059	0.3	$306	9	1
1	CalTrans along I-10	818	0.7	$278	8	1
3	Banning High School	164	0.3	$361	8	1
9	Repplier Park	28	0	$297	7	1
10	Deutsch Company Park	20	0	$300	7	1
8	Neighborhood Park	31	0.1	$318	7	1
16	Sun Lakes Development	1,085	1.2	$261	7	1
15	Pardee Development	1,123	2.2	$360	7	1
2	Gilman Historic Ranch	241	0.9	$540	6	2
17	Five Bridges Development	210	0.7	$436	6	2
12	Mountain Avenue Park	13	0.1	$756	6	2
6	Lions Park	37	0.4	$902	6	2
7	Sylvan Park	32	0.3	$956	6	2
5	Rehab & Counseling Center	82	0.5	$692	5	2
4	Dysart Park	82	0.6	$748	5	2
18	Black Bench	520	2.6	$781	6	2
13	Banning USD	12	0.2	$1,120	5	2
11	Roosevelt Williams Park	19	0.7	$2,344	4	3

5,576 – 19 = 5,557

As shown in Table 2.9, it can be concluded that it is cost-effective to serve most of the customers, with the exception of Roosevelt Williams Park (Priority 3). Customers with a high priority (Priority 1) are Loma Linda Development, CalTrans along I-10, Banning High School, Repplier Park, Deutsch Company Park, Neighborhood Park, Sun Lakes Development, and Pardee Development. It should be noted that recycled water service to the Black Bench development would be more costly than presented in Table 2.9, as the unit cost exclude the 700 hp pump station and energy cost required to deliver recycled water to this development, which is located 1,000-1,500 feet above the existing City. This customer is therefore included in phase 3 (see Table 7.1).

Recycled water service to Roosevelt Williams Park is relatively expensive due to its small demand (19 ac-ft/yr) and relatively long pipeline (0.7 miles). Based on the high unit cost, this customer is excluded from the backbone system and alternative analyses presented in Section 6. The recycled water demands of the customers that are included in the alternative analyses presented in Section 6 are summarized in Table 2.10.

Table 2.10 Recycled Water Demand Projections Summary
Recycled Water Master Plan
City of Banning

AVERAGE DAY DEMAND

MAX. DAY DEMAND

Customers	Irrigation Area		Build Out Demand		
	(acre)	(percent)	ADD (ac-ft/yr)	ADD (mgd)	MDD (mgd)
Existing Potable Water Users	578	44%	2,644	2.4	6.7
Specific Plan Developments	738	56%	2,911	2.6	7.3
Total	**1,316**	**100%**	**5,555**	**5.0**	**14.0**

Note: All values exclude Roosevelt Park.

The irrigation water demands from the Black Bench and Pardee developments could potentially be served with untreated State Water Project (SWP) water from a pipeline that ends near the northwestern portion of the City's service area. The feasibility of using untreated SWP for these developments is evaluated in Section 6.

As listed in Table 2.10, approximately 44 percent of the potential recycled water demands identified are existing potable water customers that could be converted to recycled water, while the remaining 56 percent of demand is associated with the near-term future developments. As mentioned in the population discussion, only 31 percent of the City's service area will be developed after the completion of the five near-term developments. Hence, an increase in recycled water demands beyond the projected 5.0 mgd or 5,555 ac-ft/yr should be anticipated and system sizing should accommodate this future growth potential.

3.0 RECYCLED WATER SUPPLIES

This Section includes a discussion of the following recycled water supply sources:

- ✓ Banning Wastewater Treatment Plant (WWTP)
- ✓ Groundwater Well R-1
- ✓ Untreated State Water Project (SWP) water
- ✓ Loma Linda Satellite Plant
- ✓ Black Bench Satellite Plant
- ✓ Intercepted Storm Flow

The locations of these potential recycled water sources are depicted on Figure 3.1. This section concludes with a comparison of the available recycled water supplies and the projected recycled water demands.

3.1 Banning Wastewater Treatment Plant

The Banning WWTP is located in the southeast portion of the City will be the primary source for recycled water. The quantity of recycled water that can supply current demands depends on the available wastewater and plant capacity. The existing plant has a rated capacity of 3.6 mgd, and currently treats average flows of approximately 2.8 mgd to secondary standards. The treatment process includes screening, grit removal, primary clarification, trickling filters, and secondary clarifiers. Anaerobic digesters and sludge drying beds are used for sludge stabilization and dewatering. The headworks, completed in 1999, was sized for an ultimate capacity of 7.8 mgd [2]. The plant currently discharges its effluent to percolation ponds.

According to Title 22 of the California Code of Regulations, recycled water to be used for unrestricted irrigation of public spaces must be filtered and disinfected to tertiary standards. To meet the tertiary standards, the current treatment process needs to be substantially upgraded including filters or microfiltration, and disinfection either with chlorination or ultraviolet light [2].

The existing secondary treatment plant operates on an unsteady state mode; it treats the normal diurnal influent wastewater flows as they peak and ebb throughout the day. A new tertiary treatment process will operate on a steady state mode, and potentially reduce the amount of equalization storage required as presented in this report. Inter-plant flows between secondary treatment and tertiary treatment will need to be equalized. This can be accomplished by sending intermediate effluent from the secondary treatment process to an equalization basin before sending flow to tertiary treatment.

After recycled water is produced by tertiary treatment, it will be stored on-site for the distribution system. On-site storage for recycled water can consist of a lined earthen reservoir with a floating cover.

The plant currently discharges its effluent to percolation ponds; it is assumed that when the recycled water system is in operation the primary disposal method will be the recycled water system. Up to one hundred percent of the plant effluent can be used to produce recycled water. The percolation ponds may be used during periods when the effluent flow exceeds the recycled water demand. The WWTP upgrade to a total capacity of 5.1 mgd is currently under design.

3.2 Groundwater Well R-1

When the City conducted a study to evaluate the feasibility of constructing an irrigation water system in 1991, a new groundwater well, Well R-1, was identified as the initial source for irrigation water. This well has a potential discharge capacity of 1,500 gallons per minute (gpm) [1]. This well is located 0.2 miles east of the WWTP near the intersection of Hathaway Street and Westward Avenue (see Figure 3.1).

With the increase in potential recycled water demands associated with the new developments, the capacity of Well R-1 is no longer sufficient to supply all the existing and future potential customers with recycled water. The Banning Wastewater Treatment Plant will be the primary source for producing the major supply of recycled water to all the potential customers, while groundwater pumped from Well R-1 has been identified as a secondary source. Due to its close proximity to the WWTP, it is assumed that the City would connect this well with the recycled water pump station forebay at the WWTP.

3.3 Untreated State Project Water

A third potential recycled water source is untreated State Water Project (SWP) water. There is a 36-inch diameter SWP pipeline, the East Branch Extension Pipeline, which delivers untreated SWP water to the Noble Creek Spreading Grounds. The location of the spreading grounds is shown on Figure 3.1. As shown in this figure, the pipeline ends in the City of Beaumont, approximately 2 miles west of the City's northwest boundary.

Although this pipeline is sized to deliver SWP water for groundwater recharge, it is assumed that this pipeline would have sufficient capacity to convey untreated SWP water to the northern portions of the City. The potential use of this source to serve the irrigation demands in the Pardee and Black Bench developments, with a combined demand of 1,643 ac-ft/yr or 4.1 mgd under MDD conditions, is evaluated in Section 6. The availability of this supply would also need to be confirmed with the San Gorgonio Pass Water Agency (Pass Agency). Based on a velocity of 5 feet per second (ft/s), the irrigation demand of the Black Bench development would require approximately 18 percent of the pipeline capacity under MDD conditions.

City of Banning
Recycled Water Master Pan

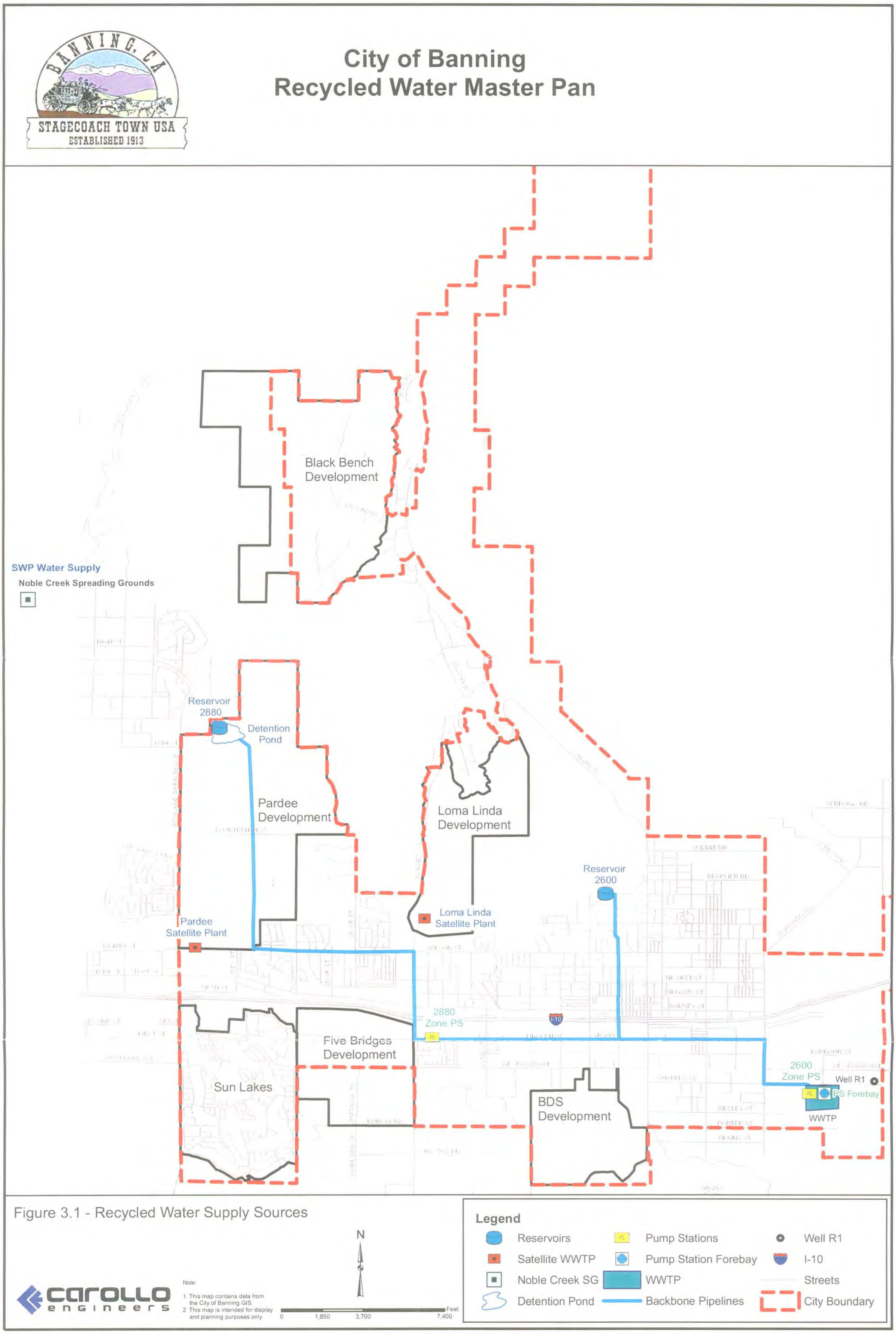

Figure 3.1 - Recycled Water Supply Sources

3.4 Loma Linda Satellite Plant

The Sewer Master Plan that is currently being developed includes an evaluation of the use of satellite WWTPs in combination with the planned Banning WWTP upgrade and expansion. One of the alternatives considers the construction of a satellite WWTP for the Loma Linda development. This plant would be located near the intersection of Sunset Avenue and Wilson Street, where it can collect all the future wastewater flows of the Loma Linda and Black Bench developments.

286 GPD/UNIT   274 GPD/UNIT

The Loma Linda development consist of 944 dwelling units and has a projected wastewater flow of 0.08 mgd and 0.27 mgd under Phase 1 and Build Out conditions, respectively. The Black Bench development consist of 1,499 dwelling units and has a projected wastewater flow of 0.11 mgd and 0.41 mgd under Phase 1 and Build Out conditions, respectively. Hence, this satellite plant could serve approximately 0.68 mgd or 760 acre-ft of recycled water demand per year.

100% RECLAIMED FACTOR

It should be noted that this recycled water supply capacity is in lieu of the supply from the Banning WWTP, as the expansion includes the projected sewer flows from the Loma Linda and Black Bench developments. A satellite plant could provide a benefit to the recycled water and sewer distribution systems, as local recycled demands could be served directly from the satellite plant as it avoids the need for sewer transmission capacity to the WWTP and conveyance and pumping of recycled water from the WWTP to the irrigation customers in the development.

260 GPD/UNIT

3.5 Pardee Satellite Plant

Similarly to the Loma Linda Satellite Plant, this plant would provide for a local supply of recycled water for the Pardee Development. This plant would be located near the intersection of Wilson Street and Highland Springs Avenue (east of Highland Springs Road in the vicinity of Smith Creek), where it can collect all the future wastewater flows of this new development. With 5,224 dwelling units, this development has a projected wastewater flow of 0.22 mgd and 1.36 mgd under Phase 1 and Build Out conditions, respectively. Hence, this satellite plant could serve approximately 1,526 acre-ft of recycled water demand per year.

100% RECLAIMED FACTOR ?

3.6 Intercepted Storm Flow

There is an existing detention pond located in the northern portion of the Pardee Development (see Figure 3.1). This detention pond could be used to capture storm flow from the areas north of the Pardee development. The approximate amount of storm flow that could be captured would need to be evaluated as well as its water quality characteristics, if intercepted storm flow would be considered as a supply source for the recycled water system. The ground elevation near the detention ponds is approximately 2,880 ft msl. Based on an estimated useful area of 25 acres and an average depth of 10 feet, the volume of the pond is estimated at 80 MG. As the availability of this supply source would greatly depend upon rainfall, it is not likely that this would directly contribute to the recycled water supply mix under MDD conditions. This source is therefore not included in the supply summary presented in Section 3.7. Based on discussions with City staff it is assumed that a recycled water reservoir tank would be located at the detention pond site to serve the 2880 Zone. The remainder of the site could be used to construct a detention pond that could be used for 1) groundwater recharge and 2) supplemental supply for the recycled water system if sufficient storm water runoff is available that meets water quality standards. It is recommended that the use of intercepted storm flow as recycled water supply source is investigated in more detail.

3.7 Supply and Demand Summary

The potential recycled water supplies and their capacities are summarized in Table 3.1.

Table 3.1 Recycled Water Supplies ~~and Demand Comparison~~
Recycled Water Master Plan
City of Banning

Supply Source	Phase 1 Capacity (mgd)	Ultimate Capacity (mgd)
WWTP existing capacity	3.6	3.6
WWTP current expansion	1.5	1.5
WWTP future expansions thru 2030 (1)	n/a	0.7
WWTP future expansions thru Build Out (2)	n/a	~~3.1~~ 3.9
Satellite Plant - Loma Linda(3)	0.2	0.7
Satellite Plant - Pardee	0.2	1.4
Groundwater Well R-1	2.2	2.2
Untreated SWP water(4)	0.2	1.5
Total(5)	**7.6**	**12.6** TOTAL 14,113 AFY

(1) Based on the average wastewater flow projected for year 2030 of 7.9 mgd [22].
(2) Based on the average wastewater flow projected for build out of 11.0 mgd [22].
(3) Based on combined wastewater flow from Loma Linda and Black Bench developments.
(4) Capacity is based on the combined recycled water demand of the Pardee and Black Bench developments. The use of this source would need to be confirmed with the Pass Agency. The feasibility of this source is analyzed in Section 6.
(5) Total excludes the capacity of the two satellite plants to avoid double counting.

As shown in Table 3.1, the available recycled supply under build out conditions is 12.6 mgd, while the projected ADD under build out conditions is 4.5 mgd (see Table 2.9) 5.0 PER TABLE 2.10. This recycled water supply surplus is consistent with the City's 2005 Urban Water Management Plan [5]. However, the projected MDD under build out conditions is 12.6 mgd 14.0 MGD PER TABLE 2.10, which indicates that the recycled water demand potential slightly exceeds the available supplies. The City could supplement the difference with additional SWP supply.

Based on this comparison, it can be concluded that the City has the potential to use all its recycled water produced at the upgraded WWTP and Well R-1. To offset the need for domestic supplies, the City has excellent opportunities to maximize the use of recycled water to serve the irrigation demands in the new developments and convert existing potable water customers, where most beneficial as identified Table 2.8.

4.0 PLANNING CRITERIA AND ASSUMPTIONS

This section includes a description of the planning criteria and assumptions used in this master plan to size and evaluate the recycled water distribution system and associated facilities. Items discussed are; regulatory requirements, demand estimating parameters, hydraulic parameters, and construction standards. This section concludes with a summary of cost estimating assumptions.

4.1 Regulatory Requirements

The recycled water distribution system should be designed to protect public health and safety in conformance with the guidelines and requirements of California Code of Regulations, Title 22, Division 4, Chapter 3, Article 1 through 10, Sections 60301 through 60355, the Riverside County Department of Health Services and the City of Banning.

The Regional Water Quality Control Board should issue the Discharge Order. The Riverside County Department of Health Services should also inspect the user sites and issue user permits.

4.1.1 <u>Water Quality</u>

According to Title 22 of the California Code of Regulations, recycled water to be used for unrestricted irrigation of golf courses, commercial planting areas, greenbelts, freeway landscaping, parks, playgrounds and schoolyards must be filtered and disinfected to tertiary standards to allow for full body contact. Irrigation water shall not come in contact with drinking fountains and picnic tables.

To meet tertiary water quality standards at the Banning WWTP, the treatments process at the plant would need to be substantially upgraded including filters or microfiltration, and disinfection either with chlorination or ultraviolet light [2].

Based on analysis of samples taken from Well R-1, it can be concluded that this source meets Title 22 requirements for irrigation water use, provided that groundwater is disinfected. A comparison of sampling at Well R-1 and Well C-6 is presented in Table 4.1.

Table 4.1 Groundwater Quality Comparison
Recycled Water Master Plan
City of Banning

Constituent	MCL	Unit	Well R-1	Well C-6
Nitrate (as NO_3)	$45^{(1)}$	mg/l	2.0	7.4
Total Dissolved Solids (TDS)	$500^{(2)}$	mg/l	307	220

Source: Average values from water quality records for 4th Quarter 2005 and 1st and 2nd Quarters of 2006.
(1) National Primary Drinking Water Standard
(2) National Secondairy Drinking Water Standard

Based on these test results it appears that the percolation ponds at the nearby wastewater treatment plant are not impacting the water quality of Well R-1.

4.1.2 AWWA Design Standards

The American Water Works Association has guidelines and requirements in their Manual of Water Supply Practices on Dual Water Systems (AWWA M24) that focuses on the following when planning a recycled water system [20]:

- ✓ Protect and maintain public health
- ✓ Define limitations and conditions for use of non-potable, recycled water
- ✓ Control improper use of non-potable, recycled water
- ✓ Prevent cross connection with potable water systems
- ✓ Provide physical separation from potable water systems conforming to similar standards for separation for potable water and sewer systems
- ✓ Incorporate design and construction standards
- ✓ Establish safeguards to minimize the effects of human carelessness

4.2 Hydraulic Parameters

Hydraulic planning criteria and assumptions discussed in this subsection are; network configuration, standard pipeline sizes, system pressures, pipeline velocity, pipeline headloss, storage sizing criteria, and pump station sizing criteria.

4.2.1 Network Configuration

The distribution system will consist of a network of pressurized pipelines. The configuration will comprise a single transmission main, the backbone system, that connects the City's WWTP with the gravity storage reservoirs in each pressure zone.

The backbone system will provide turnouts to connect smaller distribution system pipelines that will serve individual customers or groups of customers. The two alternative alignments for the backbone transmission main are evaluated in Section 6.

All recycled water system pipelines are sized to meet PHD.

4.2.2 Standard Pipeline Sizes

Pipeline sizes are based on the City's standard diameters as listed in Table 4.3. The non-standard 20-inch diameter pipeline is considered as an alternative to 24-inches with respect to potential cost savings. As shown in Table 4.3, the smallest pipeline considered is 8-inches in diameter.

Table 4.3 Standard Pipeline Sizes Recycled Water Master Plan City of Banning	
Pipe Diameter	Type Size
8 inches	Standard Size
12 inches	Standard Size
16 inches	Standard Size
20 inches	Non-standard Size
24 inches	Standard Size
30 inches	Standard Size

4.2.3 System Pressures

The system pressure in a recycled water system is typically designed to be slightly lower than the system pressure in the potable water system pipelines that are located in close vicinity of the recycled water pipelines to reduce the risk of contamination in the event of a pipeline break and low disinfectant residual in the recycled water system. However, this requirement can often not be met due to the following two reasons:

1) System pressure in potable water systems vary and pressure zone boundaries of potable and recycled water systems often do not overlap.

2) It is preferred to maintain a minimum pressure in the recycled water system of approximately 60 psi to meet the operating requirements for most sprinkler systems. However, the minimum pressure in potable water systems is typically 40 psi.

As the chance of cross contamination is minimal due to disinfection and a minimum horizontal separation of 10 feet between potable and recycled water pipelines, it is assumed that the recycled water system does not need to be coordinated with the existing potable water system pressure ranges.

The minimum system pressure used for pipeline sizing in this master plan is 60 psi under PHD conditions. The maximum system pressure is 200 psi, to avoid the need for more costly high-pressure class pipelines.

4.2.4 Pipeline Velocities

The maximum pipe velocity should not exceed 6 ft/s under PHD conditions with the entire distribution network in service.

4.2.5 Pipeline Headloss

The maximum headloss should not exceed 5 feet per thousand feet (ft/kft) under PHD conditions with the entire distribution network in service.

4.2.6 Storage Sizing Criteria

To operate a recycled water system with gravity reservoirs that is supplied from the Banning WWTP, three types of storage are required. These are:

1) Storage required to attenuate the hourly variation in wastewater flow and to provide a constant recycled water supply. With wastewater flows primarily occurring during the day and recycled water demands during the night, this storage component can be significant. The presence of primary or secondary storage at the WWTP will greatly affect the volume required for this storage component, which will typically be provided as a pump station forebay.

2) Storage reservoirs required to buffer demand fluctuations under MDD conditions, including the difference between PHD and MDD. The volume required for this storage component is highly dependent upon the hourly variation of the customers' demand, or the composite diurnal curve of each pressure zone.

3) Storage volume required protecting reservoirs from complete drainage. This "dead" storage provides operational flexibility and it protects pumps from pumping air, which can cause cavitation problems.

The first storage component, PS forebay storage, was calculated based on hourly production flows from the City's WWTP for May 24, 2006 [21], during which a total of 3.1 mgd of wastewater was produced. These wastewater flows were normalized to 5.2 mgd, to predict the wastewater flow variation under build out conditions.

The second storage component, gravity storage, is calculated based on the estimated water demand of the potential customers and their associated diurnal patterns. By comparing the hourly demand fluctuation with the available recycled water supply from the WWTP and Well R-1, the storage volume can be determined. The total gravity storage volume is divided over the two pressure zones based on the their proportional demand.

The third storage component, dead storage, is required for both the PS forebay and gravity storage. The depth of all reservoirs is increased by 10 feet to account for dead storage, with a maximum storage tank height of 32 feet.

It should be noted that recycled water systems do not require storage for fire flow or emergencies, as the potable water system storage is sized for these components.

4.2.7 Pump Station Sizing Criteria

Two pump station sizing criteria were used for the system analysis in this master plan, depending on the location of reservoir storage.

1) Alternatives with gravity reservoir storage have the benefit that reservoirs provide additional supply during the peak hours of MDD (reservoir drainage) and provide buffer capacity during the minimum hours of MDD (reservoir filling). This allows

pump station sizing for the average hour demand of MDD. Hence, all pump stations that pump into a zone with gravity storage are sized for MDD.

2) Alternatives without gravity reservoir storage do not provide the benefit of additional supply from reservoirs during the peak hours of MDD. Hence, all pump stations that pump into a zone without gravity storage (closed system) need to be sized for PHD.

It is assumed that booster stations do not require backup pumping capacity for emergencies, as irrigation water supply could temporary be interrupted and the existing customers could fall back on their potable water connection if needed. The golf courses planned in the new developments are assumed to use their lakes for operational storage, which should also provide operational flexibility during temporary pump station failures.

4.3 Construction Standards

4.3.1 Pipeline Materials

The City's preferred pipeline materials are Ductile Iron Pipe (DIP) and C200 Steel pipelines. It is assumed that all pipelines are DIP, with the exception of pipelines that require a pressure rating above 150 psi.

4.3.2 Construction Techniques

The majority of the pipeline network will use open trench construction methods in all places practical. Crossings of all channels, freeways, major arterials, and train tracks will be accomplished utilizing trenchless construction techniques.

4.4 Cost Estimating Assumptions

The construction and capital cost presented in this master plan do not include the cost for facilities required serve recycled water within the development areas, such as storage, booster pumping, land, and pipelines.

4.4.1 Cost Index

Cost estimates presented in this master plan are based on the current engineering and news record (ENR) cost index for the Los Angeles metropolitan area of 8,547 published in June, 2006. Future adjustments of cost estimates presented in this report can be estimated by increasing the estimated capital cost by the ratio of the future ENR to 8,547.

4.4.2 Unit Cost

The preparation of cost estimates presented in this report are based on the assumptions and unit construction costs listed in Table 4.4.

Table 4.4	Cost Estimating Assumptions Recycled Water Master Plan City of Banning	
Category	**Description**	**Assumption**
Pipelines	***Diameter***	***Unit Cost ($/lineal ft)***
	8 inches	$ 106
	12 inches	$ 126
	16 inches	$ 152
	20 inches	$ 189
	24 inches	$ 242
	30 inches	$ 268
	36 inches	$ 340
Storage Reservoirs	***Volume (MG)***	***Unit Cost ($/gallon)***
	<1	$ 2.10
	1-3	$ 1.60
	3-5	$ 1.30
	5-10	$ 1.10
Pump Stations	***Capacity (hp)***	***Unit Cost ($/hp)***
	<100	$ 6,200
	100-500	$ 4,130
	600-1000	$ 3,100
	1000-2000	$ 2,580
Land Acquisition	***Area (acres)***	***Unit Cost ($/acre)***
	All	$350,000
Mark-ups	***Category***	***Mark-up (%)***
	Contingency	30% of Capital Cost (CC)
	Engineering, Design and Construction Mgmt	15% of CC + Contingency
	Legal and Administration	10% of CC + Contingency
Special Pipelines	***Construction Condition***	***Mark-up (%)***
Construction	Pipelines in dirt terrain	80 % of standard unit cost
	Jack-and-Bore Crossings	150 % of standard unit cost
	Tunneling	300 % of standard unit cost
Amortization	***Category***	***Unit***
	Interest	5 %
	Depreciation Period	30 years

Land acquisition cost estimates are included for gravity reservoirs and booster stations. The land area required for storage reservoirs is based on the use of cylindrical tanks with 100-foot clearance around the tank to allow space for on-site pump stations, electrical and operational equipment, and access roads. Booster stations are assumed to require 0.5 acres per facility. Land acquisition costs for the satellite plants are not included.

It should be noted that the cost of wastewater treatment is not included in this study. For the purpose of alternatives comparison it is assumed that the cost of the regional plant upgrade is comparable with cost of constructing satellite plants. A detailed cost comparison of these treatment options is included in the Banning Sewer Master Plan.

5.0 MODEL DEVELOPMENT

5.1 Model Creation

For the purpose of this master plan, a hydraulic model was created in H_2OMAP Water Version 6.0. The model creation consisted of the following steps:

- ✓ Digitizing the distribution system pipelines
- ✓ Input of model demands and diurnal curves
- ✓ Input of model facilities and associated attribute data
- ✓ Determination of pressure zones boundaries and hydraulic grade lines (HGLs)
- ✓ Setup of Model Scenarios, Demand Sets, and Facility Sets
- ✓ Sizing of pipelines and facilities for various alternatives

The model creation steps and the data used in the model are described in more detail below. It should be noted that the model was not calibrated because the entire network consists of proposed pipelines and facilities.

5.2 Recycled Water Demands

All potential recycled water customers listed in Table 2.6 were modeled as separate demand nodes. The maximum month demand (in gpm) of each customer was input as a "base demand", while the 24-hour diurnal pattern was input to simulate the demand variation during the day. The diurnal curves scale the demand per hour from maximum month demand to maximum day demand by multiplying the base demand with a 1.3 peaking factor and the hourly factor associated with the customer's diurnal pattern.

For example, the maximum month demand of Repplier Park is 37.5 gpm and irrigation is assumed to occur during an 8-hour period from 10 PM to 6 AM (see Table 2.5). With an aggregate peaking factor of 3.9 (1.3 MDD/MMD * 3.0 PHD/MDD), the simulated model demand varies from 0 gpm (between 6 AM and 10 PM) to 146 gpm during irrigation hours.

The model includes five demand sets that were used to simulate the following demand conditions:

1) MDD under Build Out conditions
2) MDD under Phase 1 conditions
3) MDD under Build Out conditions with one satellite WWTP for the Loma Linda Development

4) MDD under Build Out conditions with one satellite WWTP for the Pardee Development

5) MDD under Build Out conditions with satellite WWTPs for the Loma Linda and Pardee Developments

The demand sets 3, 4, and 5, were used to determine the recycled water system benefits by using satellite plants for the Loma Linda and Pardee developments. The demands of these developments were reduced in these demand sets as the projected wastewater flows for these satellite WWTPs were lower than the projected recycled water demands. More details on this analysis is included in Section 6.

5.3 Recycled Water Supplies

The Banning WWTP was modeled as a fixed grade node with a HGL of 2,127 feet above mean sea level (msl), which is the approximate ground elevation of the WWTP site. This source was connected with a booster pump to feed the recycled water distribution system.

The groundwater well, Well R-1, is not included in the model, as it is assumed that this well will directly discharge into the pump station forebay at the WWTP. The pump station modeled at the WWTP simulates the combined flow of these two supply sources.

Two satellite WWTPs are modeled to evaluate the impact on the sizing of the recycled water system. These satellite plants are located at the southern portion of the Loma Linda and Pardee developments to capture the wastewater generated by these developments. The HGL of the fixed grade nodes that represent the Loma Linda and Pardee satellite WWTPs are 2,665 and 2,584 feet msl, respectively, which correspond to the approximate ground elevation of the sites. The pump stations at these sites are sized to pump the estimated wastewater flow of the plants.

The SWP supply is modeled as a fixed grade node with a HGL of 2,910 ft msl at the location of the Noble Creek Spreading Grounds. The East Branch Extension Pipeline that feeds these spreading grounds is not included in the model. A pump station is modeled to feed the pipeline to the Black Bench development.

5.4 Recycled Water System

The recycled water system was digitized by connecting the WWTP with the potential recycled water customers. The network configuration consists one backbone transmission pipeline that starts at the WWTP and continues west to the Sunset Lakes and Pardee developments. The remaining customers are connected to this backbone system with smaller, dead-end, distribution system pipelines. The recycled water system does not include any looping for redundancy, as temporary interruptions of recycled water supply are considered acceptable. The backbone system also extends to the gravity reservoirs that are proposed along the San Bernardino foothills, as discussed in Section 5.4.1.

5.4.1 Pressure Zones

The proposed recycled water system includes three pressure zones. The HGL of these zones was determined by the range in ground elevations and the minimum and maximum system pressure criteria of 60 psi and 200 psi, respectively.

A lower maximum pressure would be preferred, however, this would result in more pressure zones, requiring additional booster stations and reservoirs. The pressure zone characteristics are summarized in Table 5.1.

Table 5.1 Pressure Zone Characteristics
Recycled Water Master Plan
City of Banning

Pressure Zone HGL (ft msl)	Ground Elevation Range (ft msl)	Static Pressure Range (ft msl)
2600	2,127 - 2,450	65 - 205
2880	2,405 - 2,711	60 - 193
3400(1)	2,910 - 3,180	212 - 294
4100	3,360 - 3,927	75 - 320

(1): The 3400 Zone is recommended for the upper portions of the Loma Linda and Pardee developments.

It should be noted that the Zone 4100 is required to serve the Black Bench development. Due to the large variation in ground elevation, the southern portion of this development would need to be served through a pressure reducing station to avoid excessive system pressures.

5.4.2 Pipelines

The recycled water system pipelines were digitized to connect the recycled water supply sources with the potential customers using the shortest routes possible. Due to the location of the WWTP on the far eastern portion of the City's service area, the pipeline diameters of the backbone decrease gradually in westerly direction as the design flow rate decreases. Distribution system pipelines branch in both north and south directions to serve customers. The distribution system pipeline characteristics are summarized in Table 5.2.

As listed in Table 5.2, the recycled water model includes 37 miles of pipeline, ranging from 8-inch to 30-inch in diameter. This includes all pipelines required to evaluate the various alternatives. As not all pipeline routes evaluated are part of the proposed system, the model pipeline length exceeds the length presented in the Capital Improvement Program (CIP) of this master plan.

Table 5.2 Pipeline Characteristics Recycled Water Master Plan City of Banning				
Pipeline Diameter (in)	Pipeline Length (mi)			
	Zone 2600	Zone 2880	Zone 4100	Total
8	0.4	0.4		0.8
12	2.8	2.5		5.3
16	2.1	9.1	6.0	17.2
24		4.4		4.4
30		0.8		0.8
36	8.0	0.7		8.7
Total	**13.3**	**17.9**	**6.0**	**37.1**

It should be noted that the pipeline distribution includes all potential pipelines includes, and is different from the proposed system configuration included in the Capital Improvement Program (CIP) of this master plan (Section 7).

5.4.3 Reservoir Storage

The hydraulic model includes two gravity reservoirs for zones 2600 and 2880. A gravity reservoir is not considered cost-effective for Zone 4100. Hence, it is recommended that this zone be operated as a hydro-pneumatic zone.

The total required storage volume for the City under build out conditions was calculated to be 1.4 MG. Approximately 0.4 MG of this storage is required to buffer the wastewater flow fluctations at the plant. It is assumed that this storage will be provided at the suction side of the 2600 Zone Pump Station as a pumping forebay. The remaining 1.0 MG was divided amongst the Zone 2600 and Zone 2880 reservoirs based on the proportional demand of each pressure zone.

All gravity reservoirs are modeled as circular tanks with a diameter that corresponds to the required volume with a tank height of 22 feet. Subsequently, 10 feet was added to provide for dead storage, resulting in a total tank height of 32 feet. The gravity reservoir characteristics are summarized in Table 5.3.

Table 5.3 Reservoir Characteristics Recycled Water Master Plan City of Banning				
Reservoir	Diameter (ft)	Height (ft)	Operational Volume(1) (MG)	Total Volume(2) (MG)
Equalization at WWTP	61	32	0.7	1.0
Zone 2600	51	32	0.5	0.7
Zone 2880	41	32	0.3	0.5
Total	**n/a**	**n/a**	**1.5**	**2.2**

(1) Based on a reservoir height of 22 feet.
(2) Based on a reservoir height of 32 feet.

5.4.4 Pumping Stations

The hydraulic model includes a large number of booster pumping stations and pump curves that were used to evaluate various system configurations. Depending upon the system alternative, certain pump stations and pump curves are selected (activated) to model the appropriate system conditions, while other facilities are excluded from the model runs. The pump stations and their respective modeled design points are summarized in Table 5.4.

It should be noted that the pump curves are created such that they reflect variable frequency drive (VFD) pumps to limit the variation in discharge head, while operating over significant demand fluctuations. It is recommended that the City evaluate the option to use VFDs in the preliminary design stage of the booster pumping stations.

Table 5.4 Pump Station Characteristics
Recycled Water Master Plan
City of Banning

Pump Station	From Zone	To Zone	Alternative	Flow (gpm)	Head (ft)
Zone 2600 PS	WWTP	2600	1A 1B	8,900 8,900	490 490
Zone 2880 PS	2600	2880	1A 1B	7,200 7,200	310 310
Zone 2600 PS	WWTP	2600	2A 2B 2C	8,900 13,000 15,500	490 490 490
Zone 2800 PS	2600	2880	2A 2B & 2C	7,200 11,300	310 310
Zone 2600 PS	WWTP	2600	3A 3B 3C 3D	7,000 7,900 6,100 8,900	490 490 490 490
Zone 2800 PS	2600	2880	3A 3B 3C 3D	5,400 6,300 4,400 7,200	310 310 310 310
Zone 2600 PS	WWTP	2600	4A/4B 4C 4D	8,900 11,600 8,900	490 490 490
Zone 2880 PS	2600	2880	4A/4B 4C 4D	7,200 9,900 7,200	310 310 310
Zone 2880 PS	SWP	2880	5A 5B	1,000 3,800	150 150
Zone 3000 PS(1)	2880	3000	All 4C	3,000 5,700	120 120
Zone 3400 PS(1)	3000	3400	All 4C	3,000 5,700	400 400
Zone 3400 PS(2)	3000	3400	All	4,500	520
Zone 4100 PS	SWP 3400	4100 4100	4A, 4B & 5B 4C	2,800 2,800	1200 700

(1) To Loma Linda Development (Zone 3000 is the assumed HGL of golf course ponds, Zone 3400 is to serve demand)
(2) To Pardee Development (Zone 3400 is to serve demand in the upper portion of the development).

6.0 SYSTEM ANALYSIS

This section describes the hydraulic analysis performed to define the proposed recycled water system. This section consists of a discussion of the evaluation methodology, the alternative analysis, and concludes with a proposed recycled water system layout. The phasing of the system components and cost estimates of the proposed system are presented in Section 7, the Capital Improvement Program. It should be noted that the cost estimates and system configurations presented in this Section are for comparison purposes and should not be used as a reference for the proposed system layout.

6.1 Evaluation Methodology

The evaluation methodology used to determine the most cost-effective and operational recycled water system is based on the evaluation of a number of alternatives that represent various system configurations. This process is schematically shown in Figure 6.1, while the location of the various system components are shown on Figure 6.2.

As shown in Figure 6.1, the evaluation methodology is based on a progressive process in the sense that the conclusion from the first analysis is used in the second analysis, etc. This methodology was used to reduce the number of variables amongst the alternatives and maintain a clear picture of the impact of one particular variable. For example, two backbone alignments were evaluated in the first analysis. The best alignment was then used in the second analysis, which then evaluates the best storage configuration.

To provide a consistent basis for the comparison of alternatives, capital cost estimates were prepared for the entire distribution system of each alternative using the cost estimating assumptions described in section 4.5.

In addition, a unit cost in dollars per ac-ft of recycled water served ($/ac-ft) was calculated to compare alternatives where the total system demand varies. Unit costs are a better comparison base than capital cost only. The results of the alternatives evaluation are discussed below. Two types of unit cost are calculated for alternatives that involve separate recycled water systems for one or more developments. These alternatives include 1) a system wide unit cost where total cost of the City's recycled water system is divided by the total City-wide recycled water demand, and 2) a developers unit cost where the cost the recycled water backbone system for the development is divided by the development's recycled water demand. It should be noted that the development cost does not include in-tract distribution pipelines, reservoirs, and satellite treatment plants.

All alternatives are evaluated under build out conditions, as the ultimate system demand determines the system sizing. The phasing of facilities is discussed in Section 7.

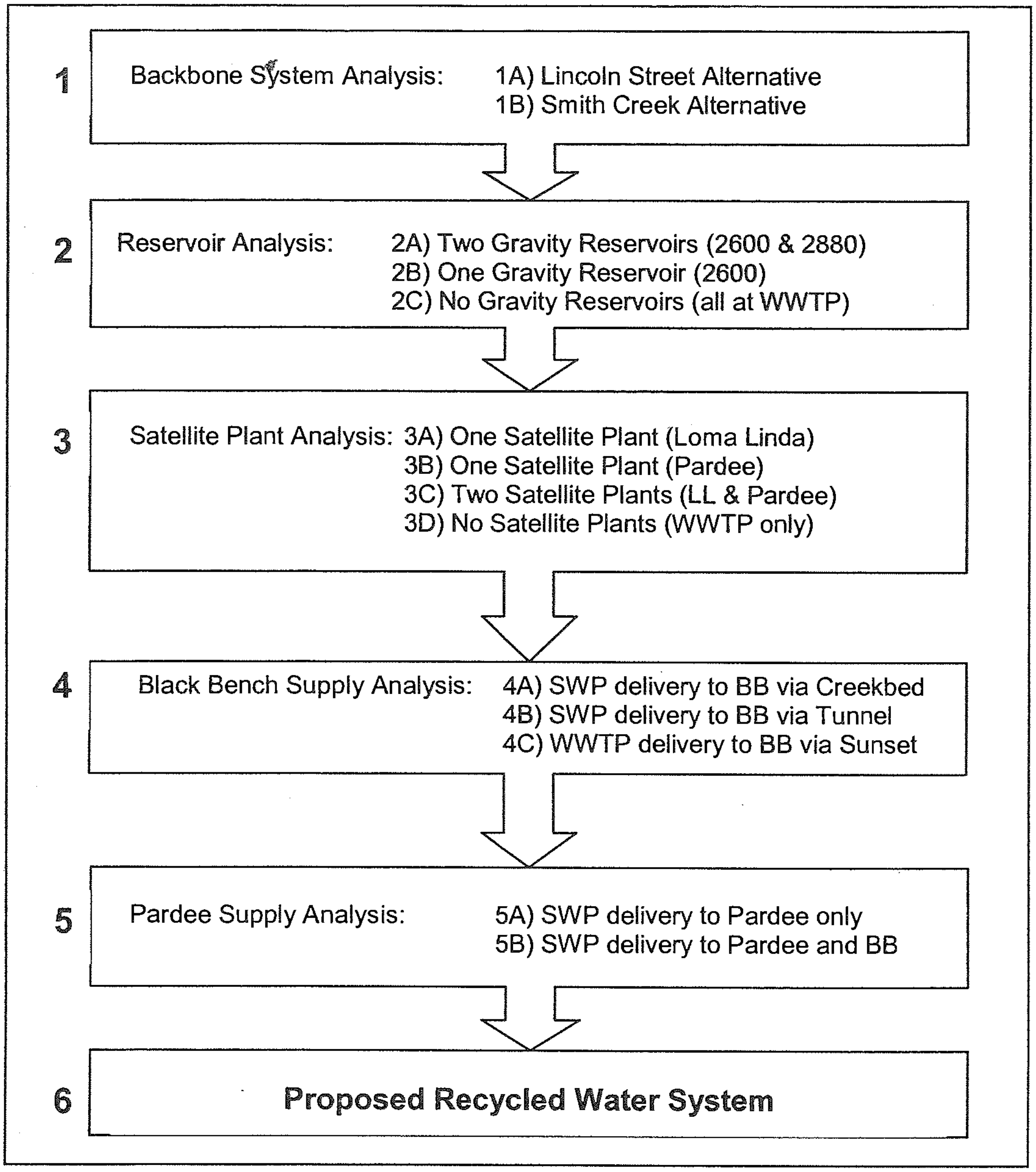

Figure 6.1 Alternatives Evaluation Process

BANNING, CA
STAGECOACH TOWN USA
ESTABLISHED 1913

City of Banning
Recycled Water Master Pan

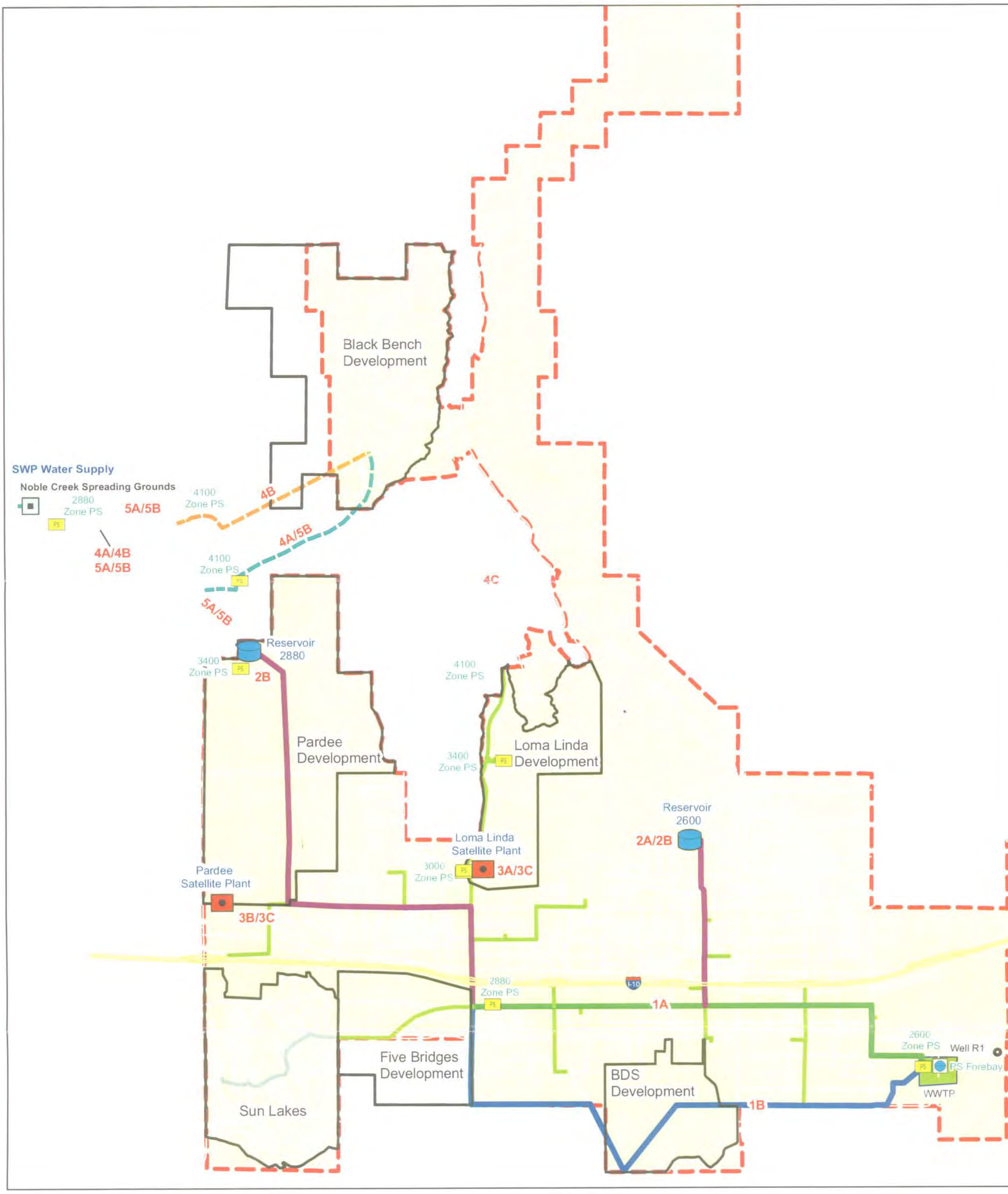

Figure 6.2 - Overview of Alternatives System Components

carollo engineers

Note

1. This map contains data from the City of Banning GIS
2. This map is intended for display and planning purposes only

N

0 1,600 3,200 6,400 Feet

Distribution System Pipeline
Reservoir Feedlines
Lincoln Street Backbone
Smith Creek Backbone
Existing Pipe
Noble Creek SG
Gravity Reservoirs
Satellite Plants
Well R1
Pump Stations
PS Forebay
Banning WWTP
I-10
Streets
City Boundary

6.2 Backbone Analysis

The first analysis performed with the recycled water model was to determine the most cost-effective alignment for the recycled water backbone system. Determining the alignment of this transmission main is a critical first step since it determines the sizing and length of all remaining distribution system pipelines. The two alternatives considered for the analysis were:

- ✓ Alternative 1A - Lincoln Street alignment
- ✓ Alternative 1B - Smith Creek alignment

The location of these alignments is depicted on Figure 6.2. The pipelines and facilities required for each alternative to serve all the potential recycled water customers, as listed in Table 2.6, were input in the model. A separate model scenario was created for each of the alternative to size the pipelines and facilities such that the planning criteria (see Section 4) were met.

Both alternatives include a 30-inch diameter backbone pipeline, 16-inch diameters that connect to the gravity reservoirs in the 2600 and 2880 zones, the 2600 PS at the WWTP, and a 2880 PS to supply the 2880 Zone. In addition, the 3400 Zone PS to the upper portions of the Loma Linda and Pardee Developments are included. Based on the Loma Linda topography and land use plan, it is assumed that recycled water will first be pumped to the Loma Linda Golf Course lakes at an approximate HGL of 3000 ft and subsequently pumped to the 3400 Zone to serve the customers. It is assumed that the 3400 Zone PS for the Pardee development be located near Reservoir 2880 at the detention pond site. These alternatives do not include the facilities, pipelines, and demands of the 4100 Zone (Black Bench Alternative), as supply to this Zone is considered not feasible based on the analysis presented in Table 2.8.

A description of the system configuration for the alternatives and a summary of the estimated cost are discussed below, while system schematics are included in Appendix C and detailed cost estimates are included in Appendix D.

6.2.1 Alternative 1A - Lincoln Street Alignment

The 3.9 miles (mi) backbone system in the Lincoln Street Alternative consists of a 30-inch diameter pipeline that runs north from the Banning WWTP along Scott Street to Charles Street, where it continues west to Hathaway Street. The pipeline runs north on Hathaway Street, and then continues west along Lincoln Street until it reaches Sunset Avenue. The 2880 Zone PS would be located along Lincoln Street between 22nd Street and Sunset Avenue.

Two reservoir feed/drain pipelines, with a combined length of 5.5 mi, are connected to the backbone system. The 16-inch diameter 2600 Zone reservoir pipeline starts at the intersection of 4th Street and Lincoln Street and runs for about 1.3 mi north along 4th Street. The 2880 Zone reservoir pipeline starts at the intersection of Lincoln Street and Sunset Avenue, where one major distribution pipeline branches off from the backbone system to feed the Sunset Lakes Golf Course and the Five Bridges development. The 24-inch diameter reservoir pipeline runs north for about 0.8 mi along Sunset Avenue, crosses Interstate 10, continues to the intersection with Wilson Street, where it reduces to a 20-inch diameter pipeline and continues west for approximately 1.4 miles to the intersection of Wilson Street and Highland Home Road. From this intersection, the pipeline is reduced to 16-inch in diameter and continues north for about 2.0 mi. The 2880 Zone reservoir pipelines has a combined length of 4.2 miles.

The distribution system consists of 8.0 miles pipeline that ranges from 8-inch to 20-inch in diameter. This does not include distribution system pipelines within the development areas and excludes the 12-inch diameter pipeline in the Sunlakes Development (see Figure 6.3).

The total pipeline length of this alternative is 17.3 miles, including 5.1 miles of construction in dirt terrain. Approximately 5.1 miles of these pipelines could be constructed in dirt terrain, with a 20 percent construction cost discount per Table 4.4.

This alternative includes five pumping stations: the 2600 Zone PS at the regional WWTP (1500 hp), the 2880 Zone PS along Lincoln Street (800 hp), the 3000 Zone PS to Loma Linda (125 hp), the 3400 Zone PS to Loma Linda (400 hp), and the 3400 Zone PS to Pardee (800 hp).

The reservoirs included in this alternative are a 0.4 MG forebay at the WWTP, a 0.6 MG Zone 2600 Reservoir, and a 1.0 MG Zone 2880 Reservoir. . This does not include storage capacity for the demands in the development areas, which is likely to be provided in golf course lakes.

It is assumed that 5.4 acres of land would need to be acquired for the two reservoir sites, the 2880 Zone PS along Lincoln Street, the 3000 Zone PS to the Loma Linda golf course ponds, and the two 3400 Zone PSs to the upper portions of the Loma Linda and Pardee Developments. This does not include land for treatment facilities, equalization storage at the regional plant, or operational storage to serve the recycled water demands in the development areas.

6.2.2 <u>Alternative 1B - Smith Creek Alignment</u>

The 4.9 mi backbone system in the Smith Creek Alternative consists of a 30-inch diameter pipeline that runs in southwest direction from the Banning WWTP to intersection of Hathaway Street and Porter Street. The pipeline continues west along Porter Street until it reaches San Gorgonio Avenue, where it continues further west to follow the proposed sewer main alignment that crosses Montgomery Creek. Once it reaches the westside of the creek, the pipeline continues west along Bobcat Road to Sunset Avenue. The 2880 Zone PS would be located along Sunset Avenue between Bobcat Road and Westward Avenue. The backbone pipeline continues further west from the discharge side of the pump station to Sunset Avenue, where it turns north and ends at the intersection with Lincoln Street.

Two reservoir feed/drain pipelines, with a combined length of 6.5 mi, are connected to the backbone system. The 16-inch diameter 2600 Zone reservoir pipeline starts at the intersection of San Gorgonio Avenue and Porter Street and runs north along San Gorgonio Avenue for about 0.5 mi, then west along Westward Avenue for about 0.2 mi, and then north again along 4th Street for about 0.7 mi. The 2600 Zone reservoir pipeline has a combined length of 2.3 miles. The 2880 Zone reservoir pipeline is identical to Alternative 1A and has a combined length of 4.2 miles.

The distribution system consists of 9.0 miles pipeline that ranges from 8-inch to 20-inch in diameter.

The total pipeline length of this alternative is 20.3 miles. Approximately 10.2 miles of these pipelines could be constructed in dirt terrain, with a 20 percent construction cost discount per Table 4.4. The total length of jack-and-bore crossing under the riverbed is estimated at 1,200 lineal feet, which has a 50 percent construction cost mark-up per Table 4.4.

This alternative also includes the five PSs listed for Alternative 1A. One exception would be the location of the 2880 Zone PS along Sunset Avenue, instead of Lincoln Street.

The reservoirs and land acquisition requirements included in this alternative are the same as listed for Alternative 1A.

6.2.3 Recommendation

The estimated construction cost, land acquisition cost, total capital cost, and unit cost are summarized in Table 6.1. Detailed cost estimates are included in Appendix D.

As shown in table 6.1, the Lincoln Street alternative is more cost effective. This cost difference is solely due to a difference in overall pipeline length, with 17.3 mi for the Lincoln Street Alternative and 20.3 mi for the Smith Creek Alternative. Also, the Smith Creek alternative has a higher potential for environmental impacts due to the creek crossing. Because the Lincoln Street Alternative does not have any major concerns that would justify the cost difference, this alternative is selected as the preferred alignment and is used for further analysis.

Table 6.1 Backbone Analysis Results Recycled Water Master Plan City of Banning		
System Component	**Alternative 1A Lincoln Street ($ million)**	**Alternative 1B Smith Creek ($ million)**
Pipelines	$16.0	$17.6
Reservoir Storage	$4.6	$4.6
Pump Stations	$10.6	$10.6
Total Construction Cost	**$31.2**	**$32.8**
Land Acquisition	$1.9	$1.9
Mark-ups	$19.5	$20.5
Total Capital Cost	**$52.7**	**$55.2**
Total Demand (ac-ft/yr)	5,035	5,035
Unit Cost ($/ac-ft)	**$680**	**$713**

Note: All numbers excludes wastewater treatment cost.

6.3 Reservoir Analysis

Recycled water storage is required to buffer the hourly fluctuation in recycled water demands and the available recycled water supply from the Banning WWTP under MDD conditions. To calculate the required storage, a spreadsheet was developed that compares the available recycled water supply and the estimated recycled water demands in 15-minute intervals for a duration of 11 days. Historical wastewater flows from the Banning wastewater treatment plant were used to simulate the variation in supply [21].

The difference between supply and demand is compensated with storage. The maximum cumulative storage between a fill and a drain cycle determines the total required storage volume. The calculated reservoir size is verified with a graph that presents the variation in recycled water demands and storage volume over the 11-day period. Once this graph shows a repetitive pattern of fill and drain cycles, the calculation is balanced. The storage calculation considers the following parameters:

- ✓ Stage of development (Phase 1 or Build Out)
- ✓ Diurnal curve for each customer (8-hr irrigation for Parks and Schools; 12-hr irrigation for Caltrans, and 24-hr delivery to Golf Courses)
- ✓ Wastewater flow rates based historical data (3.1 mgd for Phase 1 and normalized to 5.2 mgd for Build Out)
- ✓ Potential use of Groundwater Well R-1 (1,500 gpm or 2.2 mgd)
- ✓ Potential use of State Water Project (SWP) water to compensate supply shortfall.

The calculated storage volume for Phase 1 and Build Out conditions are summarized in Table 6.2. These volumes refer to total system storage and does not specify the zoning or location of the storage reservoirs.

Table 6.2 Storage Volumes
Recycled Water Master Plan
City of Banning

Storage Component	Phase 1 (MG)	Build Out (MG)
PS Forebay Storage at WWTP(1)	0.6	1.0
Operational System Storage(1)	0.3	1.2
Subtotal - City Storage	***0.9***	***2.2***
On-site Operational Storage at Golf Courses(2)	8.0	8.0
Total System Storage	**8.9**	**10.2**

(1) Does include dead storage.
(2) Does not include dead storage and excludes Black Bench storage (1.4 MG)

It should be noted that all three alternatives are based on the assumption that golf courses receive a constant amount of recycled water (24-hr delivery) and that the required storage for golf courses (8.0 MG) should be provided as on-site storage in lakes. Hence, the total required operational storage to be constructed by the City is 2.0 MG under build out conditions. As shown in Table 6.2, 1.0 MG of this storage needs to be constructed at the WWTP to buffer the fluctuations in wastewater flows and allow a constant recycled water delivery. The remaining 1.0 MG is needed to buffer the fluctuation in recycled water demands during the day.

To determine the most cost-effective location to construct operational storage, the following three alternatives were evaluated:

- ✓ Alternative 2A - Two Gravity Reservoirs (Zone 2600 and 2880)
- ✓ Alternative 2B - One Gravity Reservoir (Zone 2600)
- ✓ Alternative 2C - No Gravity Storage (all storage is located at the WWTP).

The hydraulic model was used to size the pipelines and pump stations for each alternative. The Lincoln Street Alignment was used in all alternatives as the backbone system. A description of the system configuration for the alternatives and a summary of the estimated cost are discussed below, while system schematics are included in Appendix C and detailed cost estimates are included in Appendix D. The locations of the gravity reservoirs are depicted on Figure 6.2.

6.3.1 Alternative 2A - Two Gravity Reservoirs

This alternative includes forebay storage at the Banning WWTP (1.0 MG) and gravity storage in Zone 2600 (0.7 MG) and Zone 2880 (0.5 MG). The distribution of the gravity storage is prorated based on the proportional demand of each zone.

The system configuration in this alternative is identical to system configuration of Alternative 1A, the Lincoln Street Backbone System.

6.3.2 Alternative 2B - One Gravity Reservoir

This alternative includes forebay storage at the Banning WWTP (1.0 MG) and gravity storage in Zone 2600 (1.2 MG). As there would not be any gravity storage in Zone 2880, this zone would be operated as a closed system. This alternative requires land acquisition for only one reservoir site and avoids the need for the feed/drain pipeline to Reservoir 2880. However, the 2880 Zone PS in this alternative are designed to deliver PHD instead of MDD, and should be equipped with a pump station that is designed to deliver PHD instead of MDD and is preferably equipped with variable frequency drive (VFD) pumps to maintain a fairly constant discharge pressure.

The system configuration is similar to system configuration of Alternative 1A, with the exception of the following components:

- ✓ The entire distribution system including the backbone system is 15.3 miles versus 17.3 miles in Alternative 1A.
- ✓ The estimated required land is 3.6 acres versus 5.4 acres in Alternative 1A.
- ✓ The 2880 Zone booster station is 1250 hp versus 800 hp in Alternative 1A.

6.3.3 Alternative 2C - No Gravity Reservoirs

This alternative does not include any gravity reservoirs and all system storage (2.2 MG) would be located at the Banning WWTP. As a result, both Zone 2600 and Zone 2880 would be operated as closed systems. This alternative requires no land acquisition for reservoir sites and avoids the need for reservoir feed/drain pipelines. However, the pump stations in this alternative are sized to deliver PHD instead of MDD, and should be equipped with VFD pumps to maintain a fairly constant discharge pressure.

The system configuration is similar to system configuration of Alternative 1A, with the exception of the following components:

- ✓ The entire distribution system including the backbone system is 14.6 miles versus 17.3 miles in Alternative 1A.
- ✓ The estimated required land is 2.0 acres versus 5.4 acres in Alternative 1A.
- ✓ The 2600 Zone booster station is 2500 hp versus 1500 hp in Alternative 1A.

✓ The 2880 Zone booster station is 1250 hp versus 800 hp in Alternative 1A.

6.3.4 Recommendation

The estimated construction cost, land acquisition cost, total capital cost, and unit cost are summarized in Table 6.3. Detailed cost estimates are included in Appendix D.

Table 6.3 Reservoir Analysis Results
Recycled Water Master Plan
City of Banning

System Component	Alternative 2A 2 Reservoirs ($ million)	Alternative 2B 1 Reservoir ($ million)	Alternative 2C No Reservoirs ($ million)
Pipelines	$16.0	$15.2	$13.8
Reservoir Storage	$4.6	$4.0	$3.5
Pump Stations	$10.6	$12.1	$12.7
Total Construction Cost	**$31.2**	**$31.4**	**$30.0**
Land Acquisition	$1.9	$1.3	$0.7
Mark-ups	$19.5	$19.6	$18.7
Total Capital Cost	**$52.7**	**$52.3**	**$49.4**
Total Demand (ac-ft/yr)	5,035	5,035	5,035
Unit Cost ($/ac-ft)	**$680**	**$675**	**$638**

Note: All numbers excludes wastewater treatment cost.

As shown in table 6.3, it is more cost-effective to construct larger pump stations than gravity reservoir storage, even if these reservoirs can be located fairly close to the customers. However, the benefit of gravity reservoirs for system operations is not expressed in these costs. Operating a closed pressurized water distribution system with large demand fluctuations, such as a recycled water system, is not desirable from an operational standpoint. The use of VFD pumps may reduce the pressure fluctuations, however, pumps are anticipated to continuously ramp up and down when customers turn their irrigation sprinklers systems on and off. This causes wear and tear on pumps. In addition, potential pressure spikes may cause problems at customer connections. Based on the operational constraints of closed systems, it is considered justifiable to recommend the construction of two gravity reservoirs at an incremental cost of less than $300,000 annually. Hence, alternative 2A is the preferred alternative.

6.4 Satellite Plant Analysis

The third analysis performed with the recycled water model was to determine the cost impact on the recycled water system if one or two satellite WWTPs were to be constructed to treat wastewater from the Pardee and/or Loma Linda developments. The locations of these satellite plants are depicted on Figure 6.2.

The primary advantage of using a satellite WWTP for the wastewater treatment and recycled water supply is the fact that this reduces the amount of wastewater and recycled water conveyance, as well as recycled water pumping cost. With the Banning WWTP located on the eastern end of the City's service area and the developments located on the northwestern side of the City's service area, use of satellite plant could reduce conveyance as much as 12 miles (6 miles for sewer and 6 miles for recycled water).

The sewer master plan that is currently being prepared includes a detailed cost analysis for these satellite plants. The analysis in this master plan is limited to the recycled water system components, including the recycled water pumping forebay and all downstream facilities and pipelines. The four alternatives considered for the analysis were:

- ✓ Alternative 3A - One Satellite WWTP at the Loma Linda Development
- ✓ Alternative 3B - One Satellite WWTP at the Pardee Development
- ✓ Alternative 3C - Two Satellite WWTPs at the Loma Linda and Pardee Developments
- ✓ Alternative 3D - No Satellite WWTPs, all wastewater flow is treated at the (expanded) Banning WWTP.

The hydraulic model was used to size the pipelines and pump stations for each alternative. Per the recommendations of the first and second analyses, the Lincoln Street Alignment was used in all alternatives as the backbone system and both gravity storage reservoirs were included. A description of the system configuration for the alternatives and a summary of the estimated cost are discussed below, while system schematics are included in Appendix C and detailed cost estimates are included in Appendix D.

6.4.1 Alternative 3A - One Satellite WWTP at Loma Linda

This alternative includes one satellite WWTP for the Loma Linda Development. The projected wastewater flow of this plant is 0.7 mgd under build out conditions (see Section 3.4). The remaining wastewater flow of the City would be treated at the Banning WWTP. The projected capacity of this plant under this alternative is 7.1 mgd (7.8 - 0.7).

With the objective to reduce conveyance through pipelines, it is assumed that the Loma Linda recycled water system would operate as a separate isolated recycled water system. This means that the recycled water demand that can be served is limited to the available supply. However, the estimated recycled water demand of the Loma Linda Golf Course is 1,059 acr-ft/yr or 0.95 mgd, which is greater than the available supply. The difference would need to be supplemented with potable water supply. An annual supply and demand balance is included in Appendix F. This balance shows that the average annual demand that can be served from the satellite plant is 477 ac-ft/yr, an overall system reduction of 582 ac-ft/yr. It is assumed that reservoir storage would not be required because the satellite plant would pump its recycled water directly into the on-site storage (lake) at the Loma Linda Golf Course.

The system configuration of this alternative is similar to system configuration of Alternative 1A, with the exception of the following components:

- ✓ The 2600 Zone booster station is 1250 hp versus 1500 hp in Alternative 1A.
- ✓ The 2880 Zone booster station is 500 hp versus 800 hp in Alternative 1A.
- ✓ The 3000 Zone booster station to Loma Linda is 100 hp versus 125 hp in Alternative 1A.
- ✓ The 3400 Zone booster station to Loma Linda is 100 hp versus 300 hp in Alternative 1A.
- ✓ The potential demand is 4,453 ac-ft/yr versus 5,035 ac-ft/yr in Alternative 1A.

6.4.2 Alternative 3B- One Satellite WWTP at Pardee

This alternative includes one satellite WWTP for the Pardee Development. The projected wastewater flow of this plant is 1.4 mgd under build out conditions. The remaining wastewater flow of the City would be treated at the Banning WWTP. The projected capacity of this plant under this alternative is 6.4 mgd (7.8 - 1.4).

Due to the location of Reservoir 2880, it is assumed that the Pardee Satellite Plant would feed into the City-wide recycled water system through the Zone 2880 Reservoir feedline. This means that the entire recycled water demand of the Pardee development (1,123 acr-ft/yr) can be served as it would not be limited to the available supply from the Satellite Plant.

An annual supply and demand balance is included in Appendix F. This balance shows that the average annual demand that can be served from the satellite plant is 872 ac-ft/yr, and that 251 ac-ft/yr would need to be supplemented from the regional WWTP.

The system configuration is similar to the system configuration of Alternative 1A, with the exception of the following components:

- ✓ The entire distribution system including the backbone system is 17.7 miles versus 17.3 miles in Alternative 1A.
- ✓ The 2600 Zone booster station is 1250 hp versus 1500 hp in Alternative 1A.
- ✓ The 2880 Zone booster station is 700 hp versus 800 hp in Alternative 1A.
- ✓ An additional 2880 Zone booster station of 150 hp would be required to serve the 2880 Zone from the Pardee Satellite Plant.

6.4.3 Alternative 3C- Two Satellite WWTPs at Loma Linda and Pardee

This alternative includes two satellite WWTPs for the Loma Linda and the Pardee developments. Under build out conditions, the projected wastewater flow of these plants is 0.7 mgd and 1.4 mgd, respectively. The remaining wastewater flow of the City would be treated at the Banning WWTP. The projected capacity of this plant under this alternative is 5.7 mgd (7.8 - 0.7 - 1.4).

Similarly to Alternatives 3A and 3B, it is assumed that the Loma Linda recycled water systems would operate as a separate isolated recycled water system, while the Pardee recycled water system would be connected with the City's system-wide recycled water system. This means that the recycled water demand that can be served is limited to the available supply. As described under Alternatives 3A, the average annual demand that can be served with an isolated system for the Loma Linda development is 4,453 ac-ft/yr, an overall system reduction of 582 ac-ft/yr. In addition, the regional WWTP would need to supplement 251 ac-ft/yr to the Pardee development to compensate for the difference between it wastewater supply and recycled water demand.

The system configuration is similar to the system configuration of Alternative 1A, with the exception of the following components:

- ✓ The entire distribution system including the backbone system is 17.6 miles versus 17.3 miles in Alternative 1A.
- ✓ The 2600 Zone booster station is 1,000 hp versus 1500 hp in Alternative 1A.
- ✓ The 2880 Zone booster station is 500 hp versus 800 hp in Alternative 1A.
- ✓ The 3000 Zone booster station to Loma Linda is 100 hp versus 125 hp in Alternative 1A.
- ✓ The 3400 Zone booster station to Loma Linda is 100 hp versus 300 hp in Alternative 1A.
- ✓ The potential demand is 4,453 ac-ft/yr versus 5,035 ac-ft/yr in Alternative 1A.

6.4.4 Alternative 3D - No Satellite WWTPs

This alternative does not include any satellite WWTPs, and it is assumed that all wastewater flow would be treated at the Banning WWTP. The projected capacity of this plant is 7.8 mgd.

The system configuration in this alternative is identical to system configuration of Alternative 1A, the Lincoln Street Backbone System. The potential recycled water system demand of this alternative is 5,035 ac-ft/yr.

6.4.5 Recommendation

The estimated construction cost, land acquisition cost, total capital cost, and unit cost are summarized in Table 6.4. Detailed cost estimates are included in Appendix D. These costs are based on the total system cost and the total system demand. Table 6.5 summarizes the cost estimates of the backbone facilities required to serve the developments only. Details are included in Appendix E.

Table 6.4 Satellite Plant Analysis Results - City-wide Cost
Recycled Water Master Plan
City of Banning

System Component	Alt. 3A Loma Linda ($ million)	Alt. 3B Pardee ($ million)	Alt. 3C LL & Pardee ($ million)	Alt. 3D No Sat. Plants ($ million)
Pipelines	$15.6	$16.0	$15.5	$16.0
Reservoir Storage	$4.6	$4.6	$4.6	$4.6
Pump Stations	$8.5	$11.1	$8.5	$10.6
Total Construction Cost	**$28.7**	**$31.8**	**$28.6**	**$31.2**
Land Acquisition	$1.9	$1.9	$1.9	$1.9
Mark-ups	$18.5	$19.9	$17.9	$19.5
Total Capital Cost	**$49.9**	**$53.5**	**$48.3**	**$52.7**
Total Demand (ac-ft/yr)	4,453	5,035	4,453	5,035
Unit Cost ($/ac-ft)	**$728**	**$691**	**$706**	**$680**

Note: All numbers excludes wastewater treatment cost.

Table 6.5 Satellite Plant Analysis Results - Development Cost
Recycled Water Master Plan
City of Banning

System Component	Alt. 3A Loma Linda ($ million)	Alt. 3B Pardee ($ million)	Alt. 3C LL & Pardee ($ million)	Alt. 3D No Sat. Plants ($ million)
Pipelines	$1.1	$1.1	$2.1	n/a
Reservoir Storage	$0.0	$0.0	$0.0	n/a
Pump Stations	$1.8	$2.5	$4.2	n/a
Total Construction Cost	**$2.8**	**$3.6**	**$6.4**	**n/a**
Land Acquisition	$0.4	$0.2	$0.5	n/a
Mark-ups	$1.8	$2.2	$4.0	n/a
Total Capital Cost	**$4.9**	**$6.0**	**$10.9**	**n/a**
Total Demand (ac-ft/yr)	477	872	1,349	n/a
Unit Cost ($/ac-ft)	**$674**	**$448**	**$524**	**n/a**

Note: All numbers excludes wastewater treatment cost.

As shown in Table 6.4, the most cost-effective options are Alternatives 3B and 3D. The alternatives that include a separate recycled water system served from the Loma Linda satellite WWTP (Alternatives 1A and 1C) are less attractive based on a unit cost comparison. The difference is caused by the relative substantial reduction in recycled water demand (582 ac-ft/yr), while the pipeline cost are nearly the same due to the short distance (900 lineal ft) between the Loma Linda Satellite WWTP and the proposed backbone system. As the treatment cost for the satellite plant are not included in the cost comparisons, it is expected that the total unit cost with treatment for Alternative 3B would be higher than the unit cost of Alternative 3D. In addition, satellite plants are typically not preferred due to neighborhood concerns related to odor and esthetics, and other issues such as finding an appropriate site for the plant in a new development and increased operational complexity.

Based on these considerations, it is recommended that the City implements the system configuration of Alternative 3D.

6.5 Black Bench Supply Analysis

The fourth analysis performed with the recycled water model was to determine the cost effectiveness of serving the Black Bench development with recycled water. This development is in relatively close proximity to a SWP pipeline, the East Branch Extension Pipeline, which delivers untreated SWP water to the Noble Creek Spreading Grounds.

As discussed in Section 3, the potential recycled water demand in the City under MDD conditions exceeds the available recycled water supply. It would therefore be beneficial to connect the untreated SWP supply to the City's recycled water system, and further reduce the potable water supply needs. The following three alternatives were identified for this analysis:

- ✓ Alternative 4A - SWP water delivery to Black Bench through a pipeline along Smith Creek.
- ✓ Alternative 4B - SWP water delivery to Black Bench through a pipeline and tunnel
- ✓ Alternative 4C - WWTP delivery to Black Bench through a pipeline along Sunset Avenue.

The location of the SWP pipeline, the spreading grounds, and the pipeline alignments involved in these alternatives are depicted on Figure 6.2.

The hydraulic model was used to size the pipelines and pump stations for each alternative. Per the recommendations of the first three analyses, the Lincoln Street Alignment was used in all alternatives as the backbone system, both gravity storage reservoirs were included, and all developments are supplied from the WWTP (no satellite plants). A description of the system configuration for the alternatives and a summary of the estimated cost are discussed below, while system schematics are included in Appendix C and detailed cost estimates are included in Appendix D.

6.5.1 Alternative 4A - SWP to Black Bench through a pipeline

This alternative includes a recycled water system for the Black Bench development that would be served with untreated SWP water through a 3.9-mile 16-inch diameter pipeline. This pipeline would start at the Noble Creek Spreading Grounds and then continue east along Dutton Street to Bellflower Avenue, where it would continue south to Cherry Valley Boulevard. The pipeline would run south east along Cherry Valley Boulevard and then continue east along Grand Plaza where it would branch off in the northeast direction along Smith Creek to the southwestern portion of the Black Bench development. It should be noted that this may cause environmental concerns and would require an Environmental Impact Report (EIR). This pipeline would serve the entire Black Bench demand, which is estimated at 520 ac-ft/yr.

As discussed in Section 5.4.1, the proposed HGL to serve this development is 4,100 ft msl. As the spreading grounds are located at a ground elevation of approximately 2,190 ft msl, a booster station would be required. Based on an average irrigation period of 8 hours, this development would require approximately 1.4 MG in storage. However, to avoid additional pipelines to a site with a ground elevation of nearly 4100 ft msl, it is recommended that the booster station and pipelines that would supply this development be sized to deliver peak hour demand.

The remaining portion of the system configuration is similar to recycled water system proposed for Alternative 1A, with the exception of the following components:

- ✓ The entire distribution system including the backbone system is 21.2 miles versus 17.3 miles in Alternative 1A.
- ✓ A 1250 hp booster station would be required to feed the 4100 Zone.
- ✓ The estimated required land is estimated at 5.9 acres versus 5.4 acres in Alternative 1A, to accommodate the installation of the booster station to Zone 4100.
- ✓ The potential demand is 5,555 ac-ft/yr versus 5,035 ac-ft/yr in Alternative 1A.

6.5.2 Alternative 4B - SWP to Black Bench through a pipeline and tunnel

This alternative includes a recycled water system for the Black Bench development that would be served with untreated SWP water through a 3.0-mile 16-inch diameter pipeline, of which approximately 4,000 lineal feet would needed to be tunneled. This pipeline would start at the Noble Creek Spreading Grounds and then continue east along Dutton Street to Bellflower Avenue, cross Bellflower Avenue, and continue further east along Frontier Trail. The pipeline would branch in northeast direction to the southwestern portion of the Black

Bench development. This last portion of the pipeline would require tunneling due to topography, as shown on Figure 6.2.

Similarly to Alternative 4A, this pipeline would serve 520 ac-ft/yr to the Black Bench development.

The remaining portion of the system configuration is similar to recycled water system proposed for Alternative 1A, with the exception of the following components:

- ✓ The entire distribution system including the backbone system is 20.3 miles versus 17.3 miles in Alternative 1A.
- ✓ A 1250 hp booster station would be required to feed the 4100 Zone.
- ✓ The estimated required land is estimated at 5.9 acres versus 5.4 acres in Alternative 1A, to accommodate the installation of the booster station to Zone 4100..
- ✓ The potential demand is 5,555 ac-ft/yr versus 5,035 ac-ft/yr in Alternative 1A.

6.5.3 Alternative 4C - WWTP delivery to Black Bench through a pipeline

This alternative includes a recycled water system for the Black Bench development that would be served with from the Banning WWTP through a 2.6-mile 16-inch diameter pipeline, that would be connected to the 2880 Zone. This pipeline would start just north of the intersection of Wilson Street and Sunset Avenue and then continue north along Sunset Avenue to the intersection with Bluff Street. The pipeline would continue further north along Bluff Street to Kendal Road, where it would connect with the southeastern portion of the Black Bench development.

Similarly to Alternative 4A, this pipeline would serve 520 ac-ft/yr to the Black Bench development.

The remaining portion of the system configuration is similar to recycled water system proposed for Alternative 1A, with the exception of the following components:

- ✓ The entire distribution system including the backbone system is 19.9 miles versus 17.3 miles in Alternative 1A.
- ✓ The 2600 Zone booster station is 2000 hp versus 1500 hp in Alternative 1A.
- ✓ The 2880 Zone booster station is 1000 hp versus 800 hp in Alternative 1A.
- ✓ The 3000 Zone booster station to Loma Linda is 1250 hp versus 125 hp in Alternative 1A.
- ✓ The 3400 Zone booster station to Loma Linda is 700 hp versus 300 hp in Alternative 1A.

- ✓ A 1250 hp booster station would be required to feed the 4100 Zone.
- ✓ The estimated required land is estimated at 5.9 acres versus 5.4 acres in Alternative 1A, to accommodate the installation of the booster station to Zone 4100.
- ✓ The potential demand is 5,555 ac-ft/yr versus 5,035 ac-ft/yr in Alternative 1A.

6.5.4 Recommendation

The estimated construction cost, land acquisition cost, total capital cost, and unit cost are summarized in Table 6.6. Detailed cost estimates are included in Appendix D. These costs are based on the total system cost and the total system demand. Table 6.7 summarizes the cost estimates of the backbone facilities required to serve the developments only. Details are included in Appendix E.

Table 6.6 SWP Supply Analysis Results - City-wide Cost
Recycled Water Master Plan
City of Banning

System Component	Alt. 4A ($ million)	Alt. 4B (million)	Alt. 4C ($ million)
Pipelines	$19.2	$19.7	$18.1
Reservoir Storage	$4.6	$4.6	$4.6
Pump Stations	$13.7	$13.7	$21.1
Total Construction Cost	**$37.5**	**$38.0**	**$43.8**
Land Acquisition	$2.1	$2.1	$2.1
Mark-ups	$23.4	$23.7	$27.4
Total Capital Cost	**$63.0**	**$63.8**	**$73.2**
Total Demand (ac-ft/yr)	5,555	5,555	5,555
Unit Cost ($/ac-ft)	**$738**	**$747**	**$858**

Note: All numbers excludes wastewater treatment cost.

Table 6.7 SWP Supply Analysis Results - Development Cost Only Recycled Water Master Plan City of Banning			
System Component	**Alt. 4A ($ million)**	**Alt. 4B (million)**	**Alt. 4C ($ million)**
Pipelines	$3.1	$4.6	$2.1
Reservoir Storage	$3.9	$3.9	$1.8
Pump Stations	$0.0	$0.0	$0.0
Total Construction Cost	**$7.0**	**$8.4**	**$3.9**
Land Acquisition	$0.2	$0.2	$0.2
Mark-ups	$4.4	$5.3	$2.5
Total Capital Cost	**$11.6**	**$13.9**	**$6.6**
Total Demand (ac-ft/yr)	520	520	520
Unit Cost ($/ac-ft)	**$1,445**	**$1,738**	**$823**

Note: All numbers excludes wastewater treatment cost.

As shown in Table 6.6, the most cost-effective alternative to serve the Black Bench development is Alternative 4C, which delivers recycled water from the regional WWTP via the Sunset Avenue alignment to the development.

It should be noted that the unit cost to serve this development is relatively high compared to the other alternatives due to the far distance to the remaining portion of the recycled water system or the SWP supply (3-4 miles) and the booster stations (700-1250 hp) required to serve customers at the high elevation of this development.

6.6 Pardee Supply Analysis

The fifth analysis performed with the recycled water model was to determine the cost effectiveness of serving the Pardee development with recycled water. This development is in relatively close proximity to a SWP pipeline, the East Branch Extension Pipeline, which delivers untreated SWP water to the Noble Creek Spreading Grounds.

As discussed in Section 3, the potential recycled water demand in the City under MDD conditions exceeds the available recycled water supply. It would therefore be beneficial to connect the untreated SWP supply to the City's recycled water system, and further reduce the potable water supply needs. The following three alternatives were identified for this analysis:

- ✓ Alternative 5A - SWP water delivery to Pardee from the Noble Ground Spreading Ground to Reservoir 2880.
- ✓ Alternative 5B - SWP water delivery to Pardee and Black Bench from the Noble Ground Spreading Ground to Reservoir 2880.
- ✓ Alternative 5C - No SWP water delivery to Pardee or Black Bench

The location of the SWP pipeline, the spreading grounds, and the pipeline alignments involved in these alternatives are depicted on Figure 6.2.

The hydraulic model was used to size the pipelines and pump stations for each alternative. Per the recommendations of the first three analyses, the Lincoln Street Alignment was used in all alternatives as the backbone system, both gravity storage reservoirs were included, and all developments are supplied from the WWTP (no satellite plants). A description of the system configuration for the alternatives and a summary of the estimated cost are discussed below, while system schematics are included in Appendix C and detailed cost estimates are included in Appendix D.

6.6.1 Alternative 5A - SWP to Pardee only

This alternative includes a recycled water system for the Pardee development that would be served with untreated SWP water through a 2.5-mile 12-inch diameter pipeline. This pipeline would start at the Noble Creek Spreading Grounds and then continue east along Dutton Street to Bellflower Avenue, where it would continue south to Cherry Valley Boulevard. The pipeline would run south east along Cherry Valley Boulevard and then continue further south along Canyon Plaza till it reaches Reservoir 2880. This pipeline is sized to serve the entire Pardee demand, which is estimated at 1,123 ac-ft/yr.

The spreading grounds are located at a ground elevation of approximately 2,910 ft msl. Although this is higher than the high water level of Reservoir 2880, a booster station would be required due to a high point of approximately 2,990 feet msl near the intersection of Dutton Street and Bellflower Avenue.

The remaining portion of the system configuration is similar to recycled water system proposed for Alternative 1A, with the exception of the following components:

- ✓ The entire distribution system including the backbone system is 19.8 miles versus 17.3 miles in Alternative 1A.
- ✓ A 50 hp booster station would be required to feed the 2880 Zone Reservoir from the spreading grounds.
- ✓ The estimated required land is estimated at 5.9 acres versus 5.4 acres in Alternative 1A, to accommodate the installation of the second 2880 Zone booster station.
- ✓ The potential demand is 5,555 ac-ft/yr versus 5,035 ac-ft/yr in Alternative 1A.

6.6.2 Alternative 4B - SWP to Pardee and Black Bench

This alternative includes a recycled water system for the Pardee and Black Bench developments that would be served with untreated SWP water. The same 2.5-mile pipeline would be required to connect the SWP supply source with Reservoir 2880. Due to the increased demand, the majority of this pipeline would be upsized to a 20-inch diameter. In addition, a pipeline would be required to connect to the Black Bench development. This pipeline is assumed to connect from the intersection of Bel Air Drive and Grand Plaza via the Smith Creek to the southwestern portion of Black Bench (same as Alternative 4A). This 1.9-mile pipeline would be 16-inch in diameter.

These pipelines are sized to serve the entire Pardee and Black Bench demand, which is estimated at 1,643 ac-ft/yr.

Two booster stations would be required to deliver SWP water to these developments. One booster station would pump water from the Spreading Grounds to Reservoir 2880, while the second station would pump to the 4100 Zone that serves the Black Bench development.

The remaining portion of the system configuration is similar to recycled water system proposed for Alternative 1A, with the exception of the following components:

- ✓ The entire distribution system including the backbone system is 21.7 miles versus 17.3 miles in Alternative 1A.
- ✓ A 200 hp booster station would be required to feed the 2880 Zone Reservoir from the spreading grounds.
- ✓ A 1250 hp booster station would be required to feed the 4100 Zone Reservoir from the 2880 Zone.
- ✓ The estimated required land is estimated at 6.4 acres versus 5.4 acres in Alternative 1A, to accommodate the installation of the second 2880 Zone booster station and the 4100 Zone booster station.
- ✓ The potential demand is 5,555 ac-ft/yr versus 5,035 ac-ft/yr in Alternative 1A.

6.6.3 Alternative 5C - No SWP delivery to Pardee or Black Bench

This alternative does not include SWP water supply and does not include the Black Bench development.

The system configuration in this alternative is identical to system configuration of Alternative 1A, the Lincoln Street Backbone System. The potential recycled water system demand of this alternative is 5,035 ac-ft/yr.

6.6.4 Recommendation

The estimated construction cost, land acquisition cost, total capital cost, and unit cost are summarized in Table 6.8. Detailed cost estimates are included in Appendix D. These costs are based on the total system cost and the total system demand. Table 6.9 summarizes the cost estimates of the backbone facilities required to serve the developments only. Details are included in Appendix E.

Table 6.8 Pardee Supply Analysis Results - City-wide Cost
Recycled Water Master Plan
City of Banning

System Component	Alternative 5A SWP to Pardee ($ million)	Alternative 5B SWP to Pardee & BB ($ million)	Alternative 5C No SWP Delivery ($ million)
Pipelines	$17.7	$19.9	$16.0
Reservoir Storage	$10.9	$14.7	$4.6
Pump Stations	$4.6	$4.6	$10.6
Total Construction Cost	**$33.2**	**$39.2**	**$31.2**
Land Acquisition	$2.1	$2.2	$1.9
Mark-ups	$20.8	$24.5	$19.5
Total Capital Cost	**$56.1**	**$65.9**	**$52.7**
Total Demand (ac-ft/yr)	5,035	5,555	5,035
Unit Cost ($/ac-ft)	**$724**	**$772**	**$680**

Note: All numbers excludes wastewater treatment cost.

Table 6.9 Pardee Supply Analysis Results - Development Cost Only
Recycled Water Master Plan
City of Banning

System Component	Alternative 5A SWP to Pardee ($ million)	Alternative 5B SWP to Pardee & BB ($ million)	Alternative 5C No SWP Delivery ($ million)
Pipelines	$2.6	$2.6	n/a
Reservoir Storage	$0.3	$2.4	n/a
Pump Stations	$0.0	$4.7	n/a
Total Construction Cost	**$2.9**	**$0.0**	**n/a**
Land Acquisition	$0.2	$0.4	n/a
Mark-ups	$1.8	$3.2	n/a
Total Capital Cost	**$4.8**	**$16.1**	**n/a**
Total Demand (ac-ft/yr)	1,123	1,643	n/a
Unit Cost ($/ac-ft)	**$279**	**$638**	**n/a**

Note: All numbers excludes wastewater treatment cost.

As shown in Table 6.8, it is more cost-effective to serve the Pardee development with SWP water (Alternative 5A) than with recycled water from the WWTP (Alternative 5C). It should be noted that treatment cost of SWP water is not included in the comparison.

Although there is a cost difference between Alternatives 5A and 5C, and the treatment cost of SWP water are not included in the comparison, it is recommended that the City further investigate the options to use SWP as a non-potable water supply source. As listed in Table 3.1, the City's recycled water demand exceeds the projected supply, and additional sources are therefore required. Without additional supplies, the City could only serve 90 percent of the potential 5,035 ac-ft/yr of recycled water demand, which actually increases the unit cost of Alternative 5C to $756/ac-ft. Hence, if the impact of available supplies is considered, it is more cost-effective to implement Alternative 5A than Alternative 5C. By implementing the system configuration of Alternative 5A, SWP water would be delivered at Reservoir 2880, which can benefit the entire 2880 Zone.

6.7 Proposed Recycled Water System

Based on the alternative evaluation presented herein, a combination of Alternatives 4C and 5A has been selected as the recommended recycled water system configuration for the City taking into account economic and non-economic considerations.

The proposed recycled water system consists of a backbone system along Lincoln Street, two gravity storage reservoirs in Zone 2600 and Zone 2880, and a connection with the SWP supply to the Pardee Development, and supply to Black Bench via the Sunset Avenue alignment. This alternative does not include any Satellite Plants.

The SWP supply would connect the Noble Creek Spreading Grounds with Reservoir 2880 in the northern portion of the Pardee Development. This additional supply source is crucial for the development of the City's recycled water system, as the City would have a supply shortfall of 4.7 mgd without the use of SWP water through year 2030. To provide flexibility for future expansions of the recycled water system and/or supply to a potential future water treatment plant, it is recommended that the pipeline from the SWP connection to Reservoir 2880 be sized to deliver at least 8.0 mgd or 5,500 gpm, which would require a 24-inch diameter pipeline.

The proposed recycled water system configuration is shown on Figure 6.3.

City of Banning
Recycled Water Master Pan

BANNING, CA
STAGECOACH TOWN USA
ESTABLISHED 1913

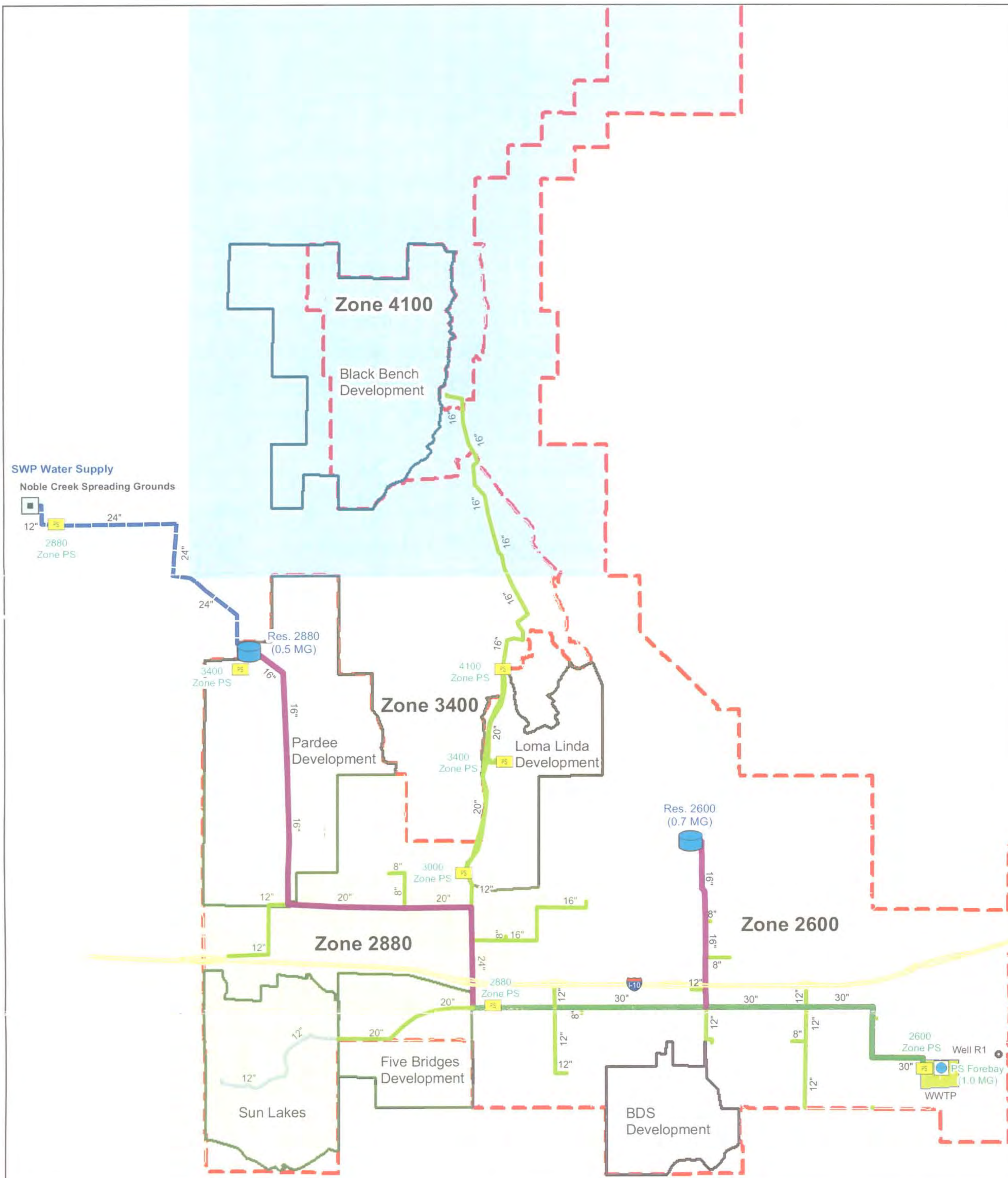

Figure 6.3 - Proposed Recycled Water System

Pipelines
Type
State Water Project Pipeline
Reservoir Feedlines
Lincoln Street Backbone
Distribution System Pipelines
Existing Pipe

Pressure Zones
Zone
4100
3400
2880
2600

Gravity Reservoirs
Noble Creek SG
Pump Stations
PS Forebay

Well R1
I-10
Streets
Banning WWTP
City Boundary

Note
1. This map contains data from the City of Banning GIS.
2. This map is intended for display and planning purposes only.

N

0 1,650 3,300 6,600 Feet

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7.0 CAPITAL IMPROVEMENT PLAN

The objective of this Section is to present the City's recycled water capital improvement program (CIP). This CIP consists of the phasing, cost estimates, and the allocation of project cost for the recommended recycled water system as defined in Section 6. The purpose of this CIP is to provide the City with a guideline for the planning and budgeting of its recycled water system, which will assist the City to accommodate future growth as it offsets the need for some of the projected potable water supplies. Due to the increasing scarcity and cost of potable water cost in Southern California, it is recommended that the City work closely with the upcoming development agencies to implement this CIP and continue to provide a reliable water supply to the City's customers.

7.1 Phasing of Improvements

The recommended improvements are divided into two development stages, Phase 1, and Build Out. The Phase 1 system consists of the infrastructure needed to serve the first phase of the five new developments and the Priority 1 customers. These customers were assigned a high ranking as discussed in Section 2 and summarized in Table 2.7. This stage also includes the following three Priority 2 customers:

1) Banning USD, because this customer can be served from the pipeline that serves Repplier Park, a Priority 1 customer.

2) Five Bridges development, because this customer can be served from the pipeline that serves Sun Lakes Golf Course, a Priority 1 customer.

3) Mountain Avenue Park, because this customers is located along the Reservoir 2880 Feed/Drain pipeline.

The Build Out system consists of the remaining infrastructure components to serve the Priority 2 customers. The demand of the Build Out system is divided into Phase 2 and Phase 3. Phase 2 includes all remaining customers and the build out demand of the five developments, with the exception of the Black Bench development, which is included in Phase 3. It should be noted that Roosevelt Williams Park (Priority 3) is not included in the proposed system. Future recycled water system expansions to serve this and other potential customers that are not identified in this master plan may be desirable beyond the planning horizon of this report. The phasing of demands is summarized in Table 7.1, while the phasing of the proposed system is shown on Figure 7.1.

Table 7.1 Phasing of Recycled Water Customers Recycled Water Master Plan City of Banning					
ID	Customer Name	Demand (ac-ft/yr)	Ranking(1)	Priority(1)	Phasing
14	Loma Linda - Phase 1(2)	316	9	1	1
1	CalTrans along I-10	818	8	1	1
3	Banning High School	164	8	1	1
9	Repplier Park	28	7	1	1
10	Deutsch Company Park	20	7	1	1
8	Neighborhood Park	31	7	1	1
16	Sun Lakes Development	1085	7	1	1
15	Pardee - Phase 1(2)	179	7	1	1
17	Five Bridges - Phase 1(2)	63	6	2	1
12	Mountain Avenue Park	13	6	2	1
13	Banning USD	12	5	2	1
TOTAL PHASE 1 DEMAND		***3,238***			
14	Loma Linda - Phase 2(2)	742	9	1	2
15	Pardee Developm. - Phase 2(2)	943	7	1	2
17	Five Bridges - Phase 2(2)	146	6	2	2
2	Gilman Historic Ranch	241	6	2	2
6	Lions Park	37	6	2	2
7	Sylvan Park	32	6	2	2
5	Rehab & Counseling Center	82	5	2	2
4	Dysart Park	82	5	2	2
TOTAL PHASE 2 DEMAND		***1,797***			
18	Black Bench Development	520	6	2	3
TOTAL PHASE 3 DEMAND		***520***			
11	Roosevelt Williams Park	19	4	3	not included
TOTAL POST PHASE 3 DEMAND		***19***			

(1) From Table 2.8.
(2) Phase 1 and Phase 2 demands are prorated by area using the data presented in Tables 2.2 and 2.6.

7.2 Cost Estimates

The estimated construction cost, land acquisition cost, total capital cost, and unit cost are summarized in by Phase in Table 7.2, while detailed cost estimates are included in Appendix D. It should be noted that unit costs for recycled water do not include treatment cost, which are evaluated in the Sewer Master Plan.

As shown in Table 7.2 and Figure 7.2, the majority of the recycled water system is included in Phase 1. However, it is anticipated that the increase of demand will occur more gradually, which results in a more even distribution of demands between Phase 1 and Phase 2.

City of Banning
Recycled Water Master Pan

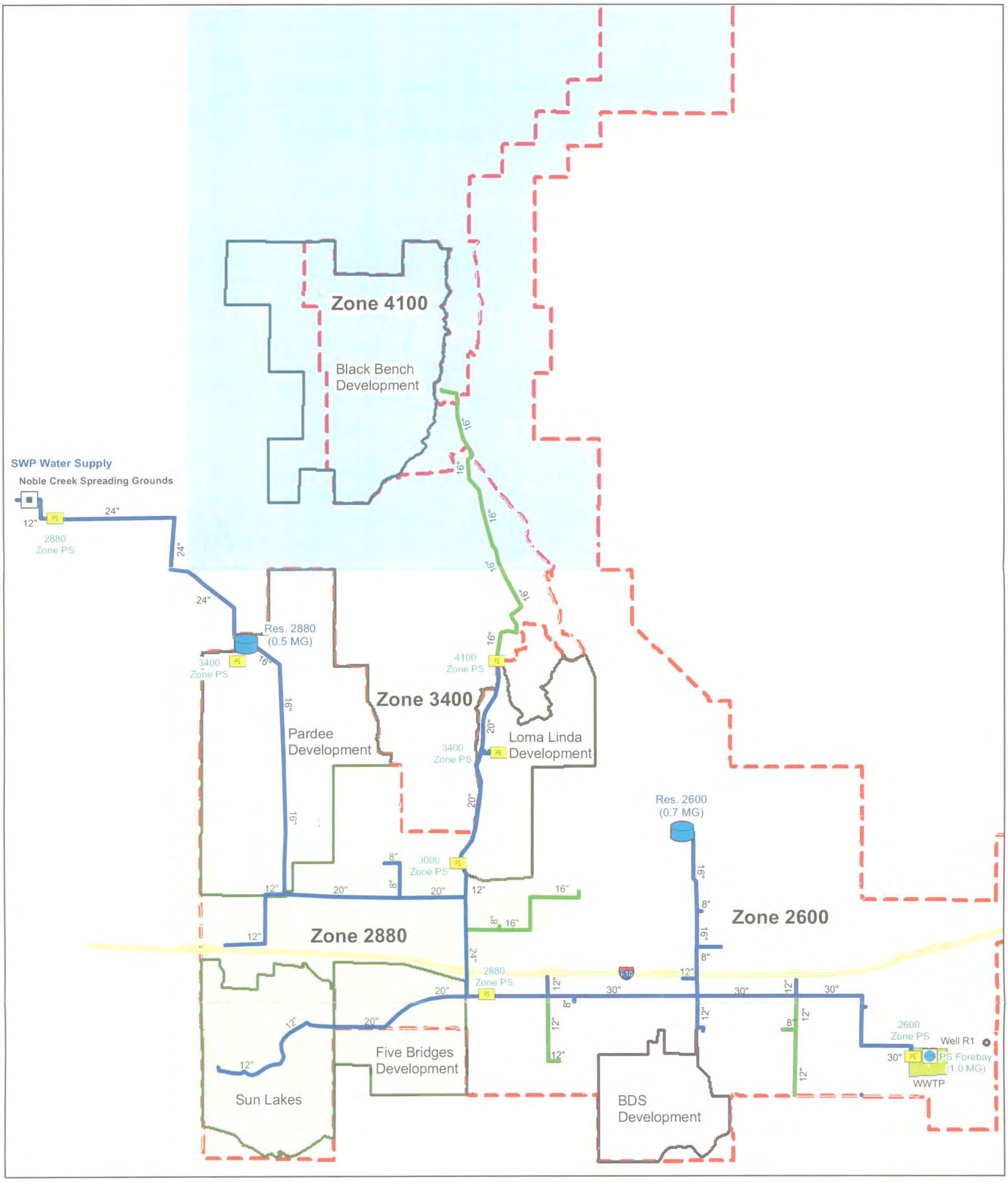

Figure 7.1 - Phasing of Proposed Recycled Water System

Note:
1. This map contains data from the City of Banning GIS.
2. This map is intended for display and planning purposes only.

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Table 7.2 Phasing of Recycled Water Cost Recycled Water Master Plan City of Banning				
System Component	**Phase 1 ($ million)**	**Phase 2 ($ million)**	**Phase 3 ($ million)**	**Build Out ($ million)**
Pipelines	$18.3	$2.1	$2.1	$22.5
Reservoir Storage	$4.6	$0.0	$0.0	$4.6
Pump Stations	$6.1	$5.1	$2.2	$13.4
Total Construction Cost	**$29.1**	**$7.1**	**$4.3**	**$40.5**
Land Acquisition	$2.1	$0.0	$0.2	$2.2
Mark-ups	$18.2	$4.5	$2.7	$25.3
Total Capital Cost	**$49.3**	**$11.6**	**$7.2**	**$68.0**
Total Demand (ac-ft/yr)	3,238	1,797	520	5,555
Unit Cost ($/ac-ft)	**$990**	**$420**	**$896**	**$797**

As a result, the unit cost of the Phase 1 system is much higher ($990/ac-ft) than the unit cost of the Phase 2 expansion ($420/ac-ft), and the Phase 3 expansion ($896/ac-ft). The weighted average unit cost of the proposed recycled water system is $797/ac-ft (not including treatment cost).

Although this unit cost is higher than the cost of imported potable water, it is expected that the potable water costs will exceed the $797/ac-ft within the next five or ten years due to potable water rate increases, particularly in Southern California where water supply is limited and rapid growth is forecasted for the next decades.

Hence, the cost of recycled water will become very attractive in the near term, as these cost are expected to remain constant, not including the effects of inflation or changes in interest rate. In addition, the investment in a recycled water system is extremely beneficial to the City as it reduces the need for additional potable water supply sources.

7.3 Distribution of Construction Cost

The distribution of construction and land acquisition cost for the proposed system under build out conditions is graphically presented in Figure 7.3. As shown in Figure 7.3, pipelines contribute to the majority of the overall system cost.

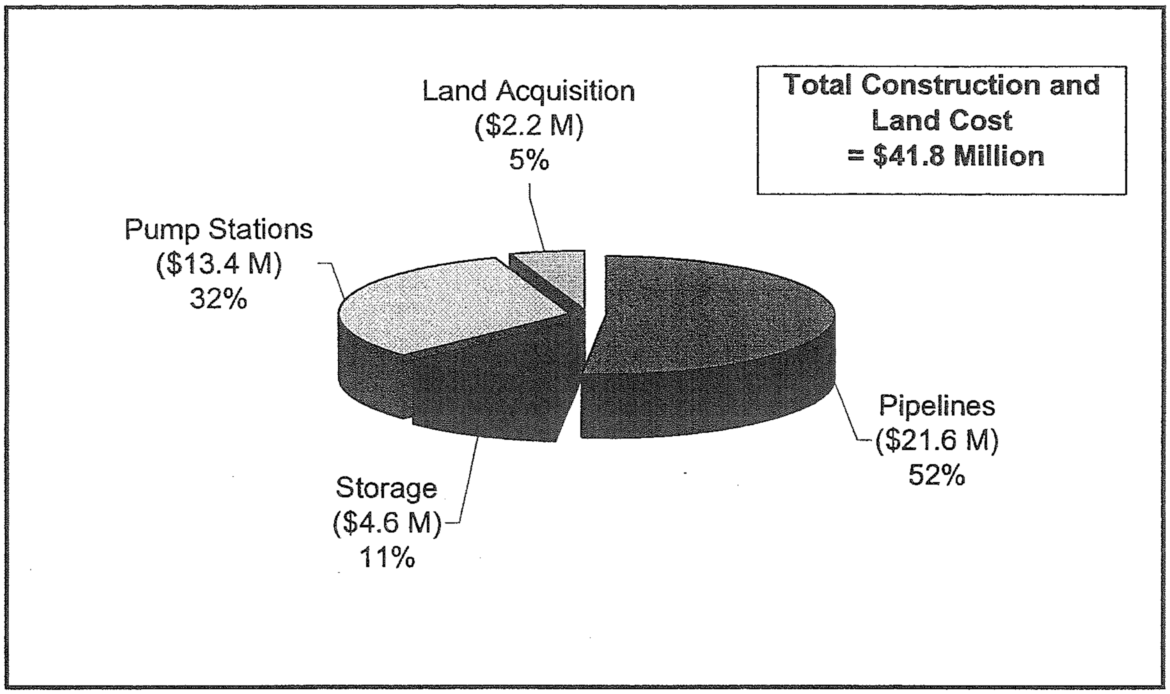


Figure 7.3 Distribution of System Construction and Land Acquisition Cost

7.4 Allocation of Capital Cost

The overall recycled water system cost can be allocated to the various developments and other small customers based on their proportional demand. This allocation is presented in Table 7.3. The allocation of treatment cost is included in the Sewer Master Plan.

Table 7.3 Allocation of Capital Cost
Recycled Water Master Plan
City of Banning

Customer	Demand (ac-ft/yr)				Capital Cost ($ million)			
	Phase 1	Phase 2	Phase 3	Total	Phase 1	Phase 2	Phase 3	Total
Loma Linda	644	414	-	1,058	$9.8	$2.7	-	$12.5
Pardee	356	767	-	1,123	$5.4	$5.0	-	$10.4
Five Bridges	68	141	-	209	$1.0	$0.9	-	$1.9
Black Bench	-	-	520	520	-	-	$7.2	$7.2
Other City Customers	2,171	474	-	2,645	$33.0	$3.1	-	$36.1
Total	**3,238**	**1,797**	**520**	**5,555**	**$49.3**	**$11.6**	**$7.2**	**$68.0**

APPENDIX I

City of Banning Water Conservation Codes and Ordinances

GEOSCIENCE

City of Banning
Office of the City Clerk

January 27, 2010

Mr. Simon Eching
California Department of Water Resource
Water Use and Efficiency Branch
P.O. Box 942836
Sacramento, CA 94236-0001

Subject: Water Conservation in Landscaping Act (AB 1881)

Dear Mr. Eching:

As required by AB 1881, enclosed with this letter is a certified copy of City Council Resolution No. 2010-06 adopted on January 26, 2010 making certain findings that the City's adopted landscaping ordinance and water conservation ordinance are as effective as the State's model water efficiency landscape ordinance.

If you have questions regarding this correspondence, please contact Zai Abu Bakar, Community Development Director at (951) 922-3131.

Regards,

Marie A. Calderon
City Clerk

encl.

RESOLUTION NO. 2010-06

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF BANNING MAKING CERTAIN FINDINGS THAT THE CITY'S WATER EFFICIENT LANDSCAPE ORDINANCE IS AS EFFECTIVE AS THE STATE'S MODEL WATER EFFICIENT LANDSCAPE ORDINANCE (MWELO) IN CONNECTION WITH AB 1881 WATER CONSERVATION IN LANDSCAPING ACT.

WHEREAS, California is experiencing its third consecutive year of sustained drought and historically drought has been a part of the California environment; and

WHEREAS, it is estimated that about half of urban water use is from landscape irrigation; and

WHEREAS, Assembly Bill (AB) 1881 the *Water Conservation in Landscaping Act* was approved by the Governor of the State of California on September 28, 2006; and

WHEREAS, AB 1881 requires local agencies to adopt a water efficient landscape ordinance by January 1, 2010, or the State's Model Water Efficient Landscape Ordinance prepared by the Department of Water Resources shall apply; and

WHEREAS, on February 14, 2006 the City Council for the City of Banning adopted new zoning regulations by approving Ordinance No. 1339; the new zoning regulations include Chapter 17.32 *Landscaping Standards* that correspond to the requirements of AB 1881. Additionally, Chapter 13.16 *Water Conservation* and Chapter 13.24 *Stormwater Code* of the municipal code contain elements that correspond to the various requirements of AB 1881; and

WHEREAS, the City now desires to notify the Department of Water Resources of compliance with AB 1881 requirements;

NOW THEREFORE BE IT RESOLVED, that the City Council of the City of Banning does hereby find, determine, and resolve as follows:

1. That the adopted regulations codified in Chapter 17.32 *Landscaping Standards,* Chapter 13.16 *Water Conservation,* and Chapter 13.24 *Stormwater Code,* copies of which are included as Exhibit "A" of this resolution and specifically detailed in the comparison chart listed below, are at least as effective in conserving water as the State's Model Water Efficient Landscape Ordinance.

2. That the City Clerk is directed to submit a copy of this resolution to the Department of Water Resources in accordance with the requirements of AB 1881.

CERTIFIED TO BE A TRUE AND CORRECT COPY OF THE ORIGINAL DOCUMENT ON FILE IN THE OFFICE OF THE CITY CLERK.

BY Marie A. Calderon

TITLE City Clerk

DATE 1-27-10

Comparison Chart

AB 1881 Requirement	Corresponding City Code/Program
65595. (a) (1) To the extent funds are appropriated, not later than January 1, 2009, by regulation, the department shall update the model water efficient landscape ordinance adopted pursuant to Chapter 1145 of the Statutes of 1990, after holding one or more public hearings. The updated model ordinance shall be based on the recommendations set forth in the report prepared pursuant to Chapter 682 of the Statutes of 2004 and shall meet the requirements of Section 65596. (c) On or **before January 1, 2010, a local agency shall adopt** one of the following: (1) **A water efficient landscape ordinance** that is, based on evidence in the record, at least as effective in conserving water as the updated model ordinance adopted by the department pursuant to subdivision (a). (2) The updated model ordinance described in paragraph (1). (d) If the local agency has not adopted, on or before January 1, 2010, a water efficient landscape ordinance pursuant to subdivision (c), the updated model ordinance adopted by the department pursuant to subdivision (a) shall apply within the jurisdiction of the local agency as of that date, shall be enforced by the local agency, and shall have the same force and effect as if adopted by the local agency.	The Zoning Code as adopted on February 14, 2006 contains Chapter 17.32 *Landscaping Standards* that corresponds with the requirements of AB 1881; also, Chapter 13.16 *Water Conservation* adopted in 1965.
65596. The updated model ordinance adopted pursuant to Section 65595 shall do all the following in order to reduce water use: (a) **Include provisions for water conservation** and the appropriate use and groupings of plants that are well-adapted to particular sites and to particular climatic, soil, or topographic conditions. The model ordinance shall not prohibit or require specific plant species, but it may include conditions for the use of plant species or encourage water conserving plants. However, the model ordinance shall not include conditions that have the effect of prohibiting or requiring specific plant species.	17.32.070; Chapter 13.16
(b) **Include a landscape water budget component** that establishes the maximum amount of water to be applied through the irrigation system, based on climate, landscape size, irrigation efficiency, and plant needs.	17.32.090
(c) **Promote the benefits** of consistent local ordinances in neighboring areas.	17.32.030(A)
(d) Encourage the capture and **retention of stormwater** onsite to improve water use efficiency or water quality.	13.24.120
(e) Include **provisions for the use of automatic irrigation systems** and irrigation schedules based on climatic conditions, specific terrains and soil types, and other environmental	17.32.030(H)

conditions. The model ordinance shall include references to local, state, and federal laws and regulations regarding standards for water-conserving irrigation equipment. The model ordinance may include climate information for irrigation scheduling based on the California Irrigation Management Information System.	
(f) Include **provisions for onsite soil assessment** and soil management plans that include grading and drainage to promote healthy plant growth and to prevent excessive erosion and runoff, and the use of mulches in shrub areas, garden beds, and landscaped areas where appropriate.	17.32.090(A)(8)
(g) **Promote the use of recycled water** consistent with Article 4 (commencing with Section 13520) of Chapter 7 of Division 7 of the Water Code.	17.32.090
(h) Seek to **educate water users** on the efficient use of water and the benefits of doing so.	17.32.100
(i) Address regional differences, including fire prevention needs.	17.32.160(A); 17.32.170(C); 8.16.020
(j) Exempt landscaping that is part of a registered historical site.	13.16.030(D)(3)
(k) Encourage the use of **economic incentives** to promote the efficient use of water.	13.08.040 – escalating commodity charge.
(*l*) Include provisions for **landscape maintenance practices** that foster long-term landscape water conservation. Landscape maintenance practices may include, but are not limited to, performing routine irrigation system repair and adjustments, conducting water audits, and prescribing the amount of water applied per landscaped acre.	17.32.050
(m) Include provisions to **minimize landscape irrigation overspray** and runoff.	17.32.090
65598. Any model ordinance adopted pursuant to this article shall **exempt cemeteries** from all provisions of the ordinance except those set forth in subdivisions (h), (k), and (*l*) of Section 65596. In adopting language specific to cemeteries, the department shall recognize the special landscape management needs of cemeteries.	13.16.030(D)(2)
535. (a) A water purveyor shall require as a condition of new retail water service on and after January 1, 2008, the installation of **separate water meters** to measure the volume of water used exclusively for landscape purposes.	Include in conditions of approval for applicable projects.

PASSED, APPROVED, AND ADOPTED this 26th day of January, 2010.

Barbara Hanna

Barbara F. Hanna, Mayor Pro Tem
City of Banning

APPROVED AS TO FORM AND
LEGAL CONTENT:

David J. Aleshire, City Attorney
Aleshire & Wynder, LLP

ATTEST:

Marie A. Calderon

Marie A. Calderon, City Clerk
City of Banning

CERTIFICATION:

I, Marie A. Calderon, City Clerk of the City of Banning, California, do hereby certify that the foregoing Resolution No. 2010-06, was duly adopted by the City Council of the City of Banning, California, at a regular meeting thereof held on the 26th day of January, 2010.

AYES:	Councilmembers Franklin, Hanna, Machisic, Robinson
NOES:	None
ABSTAIN:	None
ABSENT:	Mayor Botts

Marie A. Calderon

Marie A. Calderon, City Clerk
City of Banning, California

Exhibit "A"
to
Resolution No. 2010-06

Copies of municipal code:

Chapter 17.32 *Landscaping Standards*
Chapter 13.16 *Water Conservation*
Chapter 13.24 *Stormwater Code (including Ordinance No. 1415 amending Chapter 13.24)*

Chapter 17.32

LANDSCAPING STANDARDS

Sections:

Article I.
General Provisions

17.32.010 Purpose.

The purpose of this chapter is to establish landscaping regulations that are intended to:

A. Protect and preserve the natural environment in the City of Banning, and to incorporate green space, vegetation, and shade into the urban landscape.

B. Enhance the aesthetic appearance of development in all areas of the City by providing standards for quality, quantity and functional aspects of landscaping and landscape screening.

C. Reduce the heat and glare generated by development

D. Increase the compatibility between residential land uses and those abutting commercial and industrial land uses.

E. Provide privacy within residential developments, and to provide privacy on the perimeter of residential areas from various residential, commercial or other uses outside of the development.

F. Protect the public health, safety and welfare by minimizing the impact of all forms of physical and visual pollution, controlling soil erosion, screening incompatible land uses, preserving the integrity of neighborhoods, and enhancing pedestrian, cyclist and vehicular traffic and safety.

G. Increase the liveability of the City of Banning for children, adults, and visitors. (Zoning Ord. dated 1/31/06, § 9108.01.)

17.32.020 Application.

A. A concept landscaping plan shall be submitted as part of a planning permit application. The concept plan shall meet the intent of this chapter by exhibiting a generalized design layout which adequately demonstrates the desired landscaping program in terms of location, size/scale, function, theme and other attributes.

B. The concept plan shall provide the review authority with a clear understanding of the landscaping program prior to the preparation of a detailed, comprehensive landscaping plan. All landscaping plans must take into account the preservation of natural features including hills, topography, trees, shrubs, wildlife habitat, etc. The landscaping plan should refer to such natural elements, and enhance rather than detract from such elements.

C. Landscaping plans shall rely primarily on indigenous plant and tree species which are suitable to the local climate and soil types, rather than relying on foreign or invasive species which often compete with, and displace local species. The use of indigenous plant, shrub and tree types is also important in providing continuity of habitat for wildlife species, including local birds. The use of invasive species which have proven to be detrimental to flora species native to Southern California are strongly discouraged in all landscaping plans. Such species include the tamarisk (or salt cedar tree), and the Russian olive. Likewise many plants and trees from other areas (such as the tropics or the American southeast) have much greater water requirements than native species, and the planting and maintenance of such flora species will undermine the City's goal of water conservation. (Zoning Ord. dated 1/31/06, § 9108.02.)

17.32.030 General regulations.

A comprehensive landscaping plan shall be prepared following approval of the permit application by the review authority, and shall be submitted at the same time as the grading plan and related documents and reports. The landscape and irrigation plans shall be approved by the Community Development Department, and this department may obtain any necessary input from the Public Works Department. Landscaping requirements include the following:

A. Designs shall be in harmony with the surrounding environment.

B. Landscape design and construction shall emphasize drought-tolerant landscaping whenever and wherever possible.

C. A comprehensive landscape and irrigation plan shall include, but not be limited to:

1. List of all plants (common and Latin) including trees and shrubs;
2. Size of plants;
3. Location of plants;
4. Irrigation plan for the plants;
5. Hardscape;
6. Water elements;
7. Any other information deemed necessary by the City.

D. Planting of trees and shrubs shall comply with the following installation requirements:

1. Landscape areas shall include plant material and planting methods which are suitable for the soil of the site. The minimum percentage of plant sizes shall be as follows:

Trees:	20%, 36 inch box 50%, 24 inch box
Shrubs:	100%, 5 gallon
Groundcover:	100% coverage within 1 year

2. Trees and shrubs shall be planted so that at maturity they do not interfere with service lines, traffic safety sight area, and the basic property rights of adjacent property owners.

3. A variety of flowering trees, fragrant trees, and fruit trees, may all be included in the landscaping plan.

4. Trees planted near public rights-of-way shall have a limited deep root system and shall be installed so as to prevent physical damage to sidewalks, curbs, gutters and other public improvements.

5. Tree grates shall surround trees installed in paved areas or sidewalks. Trees with a deep root system shall be used in such areas.

F. Concrete mow strips are required to separate all turf areas from other landscaped areas in the commercial and industrial districts.

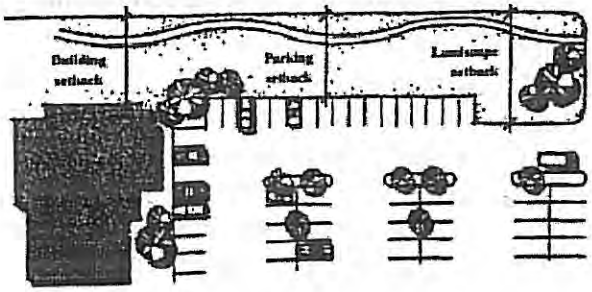
G. Inorganic groundcover shall be used in combination with live plants, and shall be used as an accent feature.

H. All landscaping shall include a water-efficient automatic irrigation system.

I. The front yards, and side yards visible from the public right-of-way, of all residential subdivisions shall be landscaped with trees, shrubs and groundcover. At a minimum, each front yard shall include 2 24 inch box trees, and sufficient shrubs and groundcover to provide full coverage within 2 years of installation. (Zoning Ord. dated 1/31/06, § 9108.03.)

17.32.040 Setback and parkway treatments.

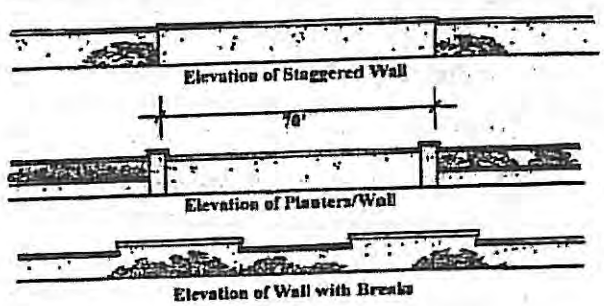
Landscape standards for setback and parkway areas shall include, but not be limited to:



A. Setback and parkway areas shall utilize uniform street tree plantings with complementary landscape materials.

B. Mounding or berming shall be incorporated within the overall design, with landscaped slopes not exceeding a three to one ratio, or four feet in height. A minimum of six feet of landscaping shall be placed on the exterior of perimeter walls and fences.

C. Walls and fences should be incorporated into the landscape design, including meandering walls, wall breaks, or openings where the design shall complement the landscaping of the adjacent development.



D. All designs shall insure compatibility with established setback and parkway areas, including transitions between landscape types and patterns.

E. Street trees shall be 24 inch box specimens or larger. (Zoning Ord. dated 1/31/06, § 9108.04.)

17.32.050 Installation and maintenance.

A. Landscaping shall be permanently maintained by the developer or his/her successors. All required landscaping shall be properly installed, irrigated, and inspected prior to the issuance of a Certificate of Occupancy.

B. Maintenance of approved landscaping shall consist of:

1. Regular watering;
2. Mowing;
3. Pruning;
4. Fertilizing;
5. Clearing of debris and weeds;
6. Removal and replacement of dead plants;
7. The repair and replacement of irrigation systems; and
8. The repair and replacement of integrated architectural features. (Zoning Ord. dated 1/31/06, § 9108.05.)

17.32.060 Removal or destruction of trees.

A. Removal of healthy, shade providing, and aesthetically valuable trees shall be strongly discouraged, and shall be in conformance with the policies and programs of the General Plan. A tree removal and replacement plan shall be required for the removal and replacement of all trees in excess of 50 years of age, unless their removal is required to protect the public health and safety.

B. Each tree that is removed in a new subdivision is considered a part of the common wealth of the citizens of Banning, is an important component of the habitat of surrounding wildlife, and is of value to the City. Each identified tree removed shall be replaced with at least one 36 inch box specimen tree, in addition to any other required landscaping. Individual single family residential lots of less than one-half acre and commercial tree farms shall be exempt from this provision. (Zoning Ord. dated 1/31/06, § 9108.06.)

Article II. Water Conservation

17.32.070 Purpose and definitions.

A. In order to assure that the City's water resources are not significantly impacted by high water consuming landscape plans, the following standards for water efficiency shall be implemented for all landscaping plans required in this chapter, under Section 17.32.020, Applicability.

B. Definitions.

Anti-drain valve or check valve means a valve located under a sprinkler head to hold water in the system so it minimizes drainage from the lower elevation sprinkler heads.

Application rate means the depth of water applied to a given area, measured in inches per hour. Also known as precipitation rate (sprinklers) or emission rate (drippers/microsprayers) in gallons per hour.

Applied water means the portion of water supplied by the irrigation system to the landscaping.

Automatic controller means a mechanical or solid-state timer, capable of operating valve stations to set the days and length of time of a water application.

Backflow prevention device means a safety device used to prevent pollution or contamination of the water supply due to the reverse flow of water from the irrigation system.

Conversion factor (0.62) means a number that converts the maximum applied water allowance from acre-inches per acre per year to gallons per square foot per year. The conversion factor is calculated as follows:

325,851 gallons/43,560 square feet/12 inches	= (0.62)
325,851 gallons	= one acre foot
43,560 square feet	= one acre
12 inches	= one foot

To convert gallons per year to 100 cubic feet per year, the common billing unit for water, divide gallons per year by 748. (748 gallons = 100 cubic feet.)

Ecological restoration project means a project where the site is intentionally altered to establish a defined, indigenous, historic ecosystem.

Effective precipitation or usable rainfall means the portion of total natural precipitation that is used by the plants.

Emitter means drip irrigation fittings that deliver water slowly from the system to the soil.

Established landscape means the point at which plants in the landscape have developed roots into the soil adjacent to the root ball.

Establishment period means the first year after installing the plant in the landscape.

Estimated annual applied water use means the portion of the estimated annual total water use that is derived from applied water. The estimated annual applied water use shall not exceed the maximum applied water allowance.

Estimated total water use means the annual total amount of water estimated to be needed to keep the plants in the landscaped area healthy. It is based upon such factors as the local evapotranspiration rate, the size of the landscaped area, the types of plants, and the efficiency of the irrigation system.

ET adjustment factor means a factor of 0.6 that, when applied to reference evapotranspiration, adjusts for plant factors and irrigation efficiency, two major influences upon the amount of water that needs to be applied to the landscape. A combined plant mix with a site-wide average 0.45 is the basis of the plant factor portion of this calculation. The irrigation efficiency for purposes of the ET adjustment factor is 0.75. Therefore, the ET adjustment factor (0.6) = (0.45/0.75).

Evapotranspiration means the quantity of water evaporated from adjacent soil surfaces and transpired by plants during a specific time.

Flow rate means the rate at which water flows through pipes and valves (gallons per minute or cubic feet per second).

Hydrozone means a portion of the landscaped area having plants with similar water needs that are served by a valve or set of valves with the same schedule. A hydrozone may be irrigated or nonirrigated. For example, a naturalized area planted with native vegetation that will not need supplemental irrigation once established is a nonirrigated hydrozone.

Infiltration rate means the rate of water entry into the soil expressed as a depth of water per unit of time (inches per hour).

Irrigation efficiency means the measurement of the amount of water beneficially used divided by the amount of water applied. Irrigation efficiency is derived from measurements and estimates of irrigation system characteristics and management practices. The minimum irrigation efficiency for purposes of this chapter is 0.75. Greater irrigation efficiency can be expected from well-designed and maintained systems.

Landscape irrigation audit means a process to perform site inspections, evaluate irrigation systems, and develop efficient irrigation schedules.

Landscaped area means the entire parcel less the building footprint, driveways, nonirrigated portions of parking lots, hardscapes such as decks and patios, and other nonporous areas. Water features are included in the calculation of the landscaped area.

Lateral line means the water delivery pipeline that supplies water to the emitters or sprinklers from the valve.

Main line means the pressurized pipeline that delivers water from the water meter to the valve or outlet.

Service line means the pressurized pipeline that delivers water from the water source to the water meter.

Maximum applied water allowance means for design purposes, the upper limit of annual applied water for the established landscaped area. It is based upon the area's reference evapotranspiration, the ET adjustment factor, and the size of the landscaped area. The estimated applied water use shall not exceed the maximum applied water allowance.

Mined-land reclamation projects means any surface mining operation with a reclamation plan approved in accordance with the Surface Mining and Reclamation Act of 1975.

Mulch means any material such as gravel, small rocks, pebbles, decorative sand, decomposed granite, bark, straw or other material left loose and applied to the soil surface for the beneficial purpose of reducing evaporation.

Operating pressure means the manufacturer's recommended pressure at which a system of sprinklers, bubblers, drippers or microsprayers is designed to operate.

Overhead sprinkler irrigation systems means those with high flow rates (pop-ups, impulse sprinklers, rotors, etc.)

Overspray means the water which is delivered beyond the landscaped area, wetting pavements, walks, structures, or other non-landscaped areas.

Plant factor means a factor that when multiplied by reference evapotranspiration, estimates the amount of water used by plants. For purposes of this chapter, the average plant factor of very low water using plants ranges from 0.01 to 0.10, for low water using plants the range is 0.10 to 0.35, for moderate water using plants the range is 0.35 to 0.60 and for high water using plants, the range is 0.60 to 0.90.

Rain sensing device means a system which automatically shuts off the irrigation system when it rains.

Record drawing or as-builts means a set of reproducible drawings which show significant changes in the work made during construction which are usually based on drawings marked up in the field and other data furnished by the contractor.

Recreational area means areas of active play or recreation such as sports fields, school yards, picnic grounds, or other areas with intense foot traffic.

Recreational turfgrass means turfgrass that serves as a playing surface for sports and recreational activities. Athletic fields, golf courses, parks and school playgrounds are all examples of areas hosting recreational turf grass.

Recreational turfgrass ET adjustment factor means a factor of 0.82 that, when applied to reference evapotranspiration, adjusts for the additional stress of high traffic on recreational turfgrass and the higher irrigation efficiencies of long range rotary sprinklers. These are the two major influences upon the amount of water that needs to be applied to a recreational landscape. A mixed cool/warm season turfgrass with a seasonal average of 0.7 is the basis of the plant factor portion of this calculation. The irrigation efficiency of long range sprinklers for purposes of the ET adjustment factor is 0.85. Therefore, the ET adjustment factor is 0.82 = 0.7/0.85.

Recycled water, reclaimed water or treated sewage effluent water means treated or recycled waste water of a quality suitable for nonpotable uses such as landscape irrigation; not intended for human consumption.

Reference evapotranspiration or ETo means a standard measurement of environmental parameters which affect the water use of plants. ETo is given in inches per day, month, or year, and is an estimate of the evapotranspiration of a large field of cool-season grass that is well watered. Reference evapotranspiration is used as a basis of determining the maximum applied water allowances so that regional differences in climate can be accommodated. For purposes of this chapter, the following ETo zone map will be used. (See map attached to the ordinance codified in this chapter.)

Rehabilitated landscape means any relandscaping project whose choice of new plant material and/or new irrigation system components is such that the calculation of the site's estimated water use will be significantly changed. The new estimated water use calculation must not exceed the maximum applied water allowance calculated for the site using a 0.6 ET adjustment factor.

Runoff means water which is not absorbed by the soil or landscape to which it is applied and flows from the planted area. For example, runoff may result from water that is applied at too great a rate (application rate exceeds infiltration rate), when there is a severe slope or when water is misapplied to hardscapes.

Soil moisture sensing device means a device that measures the amount of water in the soil.

Soil texture means the classification of soil based on the percentage of sand, silt and clay in the soil.

Sprinkler head means a device which sprays water through a nozzle.

Static water pressure means the pipeline pressure when water is not flowing.

Station means an area served by one valve or by a set of valves that operates simultaneously.

Turf means a surface layer of earth containing mowed grass with its roots. Perennial and Annual Ryegrass are cool season grasses. Hybrid and common Bermuda grass, are warm season grasses.

Valve means a device used to control the flow of water in the irrigation system.

Water conservation concept statement means a one-page checklist and a narrative summary of the project.

Water feature means any water applied to the landscape for non-irrigation decorative purposes. Fountains, streams, ponds and lakes are considered water features. Water features use more water than efficiently irrigated turf grass and are assigned a plant factor value of 1.1 for a stationary body of water and 1.2 for a moving body of water. (Zoning Ord. dated 1/31/06, § 9108.07(1).)

17.32.080 Applicability.

A. Except as provided in Section 17.32.030, this article shall apply to:

1. All new and rehabilitated landscaping for private, public, commercial and governmental development projects that require a permit; and
2. Developer-installed landscaping in single-family tracts and multifamily projects.

B. Projects subject to this section shall conform to the provisions in this section.

C. This section shall not apply to resident homeowner-provided landscaping at single-family residences. (Zoning Ord. dated 1/31/06, § 9108.07(2).)

17.32.090 Landscape documentation package.

A. Each landscape documentation package shall include the following elements, which are described below under "Elements of Landscape Documentation Package".

1. Water conservation concept statement;
2. Calculation of the maximum applied water allowance;
3. Calculation of the estimated applied water use;
4. Calculation of the estimated total water use;
5. Landscape design plan;
6. Irrigation design plan;
7. Grading design plan:
8. Soil analysis (optional);

9. Certificate of substantial completion. (To be submitted by certified landscape designer, auditor or landscape architect after installation of the project.)

B. Three copies of the landscape documentation package conforming to this chapter shall be submitted to the city. No permit shall be issued until the city reviews and approves the landscape documentation package. Prior to preparation and submission of the landscape documentation package, the preliminary landscape design shall be approved by the Planning Commission.

C. A copy of the approved landscape documentation package shall be provided to the property owner or site manager along with the record drawings and any other information normally forwarded to the property owner or site manager.

D. Upon completion of construction, a copy of the water conservation concept statement and the certificate of substantial completion shall be sent by the project manager to the water management specialist of the water district and city/county having jurisdiction.

ELEMENTS OF LANDSCAPE DOCUMENTATION PACKAGE

A. Water Conservation Concept Statement. Each landscape documentation package shall include a cover sheet, referred to as the water conservation statement similar to the following example. It serves as a checklist to verify that the elements of the landscape documentation package have been completed and has a narrative summary of the project.

SAMPLE WATER CONSERVATION CONCEPT STATEMENT

Project Site:__________________________________ Case Number:________________

Project Location:____

Landscape Architect/Irrigation Designer/Contractor:______________________________

Included in this project submittal package are: (Check to indicate completion)

_____1. Maximum Annual Applied Water Allowance:
Conventional Landscape: _______ 100 cubic feet/year
+ Recreational Turfgrass Landscape: _______ 100 cubic feet/year (if applicable)
Total Maximum Annual Applied Water Allowance:______100 cubic feet/year ____

_____2. Estimated Annual Applied Water Use by Hydrozone:
Turfgrass: _______ 100 cubic feet/year
Recreational Turfgrass: _______ 100 cubic feet/year
Exotic Trees/Shrubs/Groundcovers: _______ 100 cubic feet/year
Desert Plants: _______ 100 cubic feet/year
Water features: _______ 100 cubic feet/year
Other ______________________: _______ 100 cubic feet/year ____

_____3. Estimated Annual Total Water Use:
_______ 100 cubic feet/year ____

_____4. Landscape Design Plan
_____5. Irrigation Design Plan
_____6. Grading Design Plan
_____7. Soil Chemical Analysis (Optional)

Description of Project: (Briefly describe the planning and design actions that are intended to achieve conservation and efficiency in water use.)

____
____
____
____
____

Date:__________ Prepared by:______________________________

B. The Annual Maximum Applied Water Allowance

a. A project's annual maximum applied water allowance shall be calculated using the following formula:

MAWA = (ETo) (0.6) (LA) (0.62) where:

MAWA	=	Maximum applied water allowance (gallons per year)
Eto	=	Reference evaportranspiration (i.e., 75.0 inches per year)
0.6	=	ET adjustment factor
LA	=	Landscaped area (square feet)
0.62	=	Conversion factor (to gallons per square foot)

b. An example calculation of the annual maximum applied water allowance is:

Project site: Landscape area of fifty thousand square feet in Zone No. 3a of the City ETo Map.

MAWA = (ETo) (.6) (LA) (0.62)
= (75.0 inches) (.6) (50,000 square feet) (.62)

Maximum applied water allowance = 1,395,000 gallons per year, 1,865 hundred-cubic-feet per year (billing units), 4.28 acre feet/acre per year or 51.4≤ of water per year.

C. Estimated Annual Applied Water Use.

a. The annual estimated applied water use shall not exceed the annual maximum applied water allowance.
b. A calculation of the estimated annual applied water use shall be submitted with the landscape documentation package.

c. The estimated annual total water use for each hydrozone is calculated from the following formula:

EWU (hydrozones) (in 100 cubic feet) = (ETo) (PF) (HA) (.62)/748 (IE)

EWU (hydrozone)	=	Estimated water use (gallons per year)
Eto	=	Reference evapotranspiration (i.e., ETo Zone 3a = 75.00 inches per year)
PF	=	Plant factor (see definitions)
HA	=	Hydrozone area (square feet)
(.62)	=	Conversion factor
(IE)	=	Irrigation efficiency (see Section 17.04.070, Definitions)
748	=	Conversion to billing units (100 cubic feet)

D. Estimated Annual Total Water Use.

A calculation of the estimated annual total hydrozone water use shall be submitted with the landscape documentation package. The estimated annual total water use for the entire landscaped area equals the sum of the estimated annual water use (EWU) of all hydrozones in that landscaped area.

E. Landscape Design Plan.

A landscape design plan meeting the following requirements shall be submitted as part of the landscape documentation package.

a. Plant Selection and Grouping.

i. Any plants may be used in the landscape, providing the estimated annual applied water use recommended does not exceed the maximum annual applied water allowance and that the plants meet the specifications set forth in subsections (C)(5)(a)(ii), (iii) and (iv) of this section.

ii. Plants having similar water use shall be grouped together in distinct hydrozones.

iii. Plants shall be selected appropriately based upon their adaptability to the climate, geologic, and topographical conditions of the site. Protection and preservation of native species and natural areas is encouraged. The planting of trees is encouraged whenever it is consistent with the other provisions of this chapter.

iv. Fire prevention needs shall be addressed in areas that are fire prone. Information about fire prone areas and appropriate landscaping for fire safety is available from the fire marshal.

b. Water Features.

i. Recirculating water shall be used for decorative water features.

c. Landscape Design Plan Specifications.

The landscape design plan shall be drawn on project base sheets at a scale that accurately and clearly identifies:

i. Designation of hydrozones;
ii. Landscape materials, trees, shrubs, groundcover, turf and other vegetation. Planting symbols shall be clearly drawn and plants labeled by botanical name, common name, water use classification, container size, spacing and quantities of each group of plants indicated;
iii. Property lines and street names;
iv. Streets, driveways, walkways and other paved areas;
v. Pools, ponds, water features, fences and retaining walls;
vi. Existing and proposed buildings and structures including elevation, if applicable;
vii. Location of all overhead and underground utilities.
viii. Natural features including but not limited to rock outcroppings, existing trees and shrubs that will remain;
ix. Tree staking, plant installation, soil preparation details, and any other applicable planting and installation details;
x. A calculation of the total landscaped area;
xi. Designation of recreational areas.

F. Irrigation Design Plan.

An irrigation design plan meeting the following conditions shall be submitted as part of the landscape documentation package.

a. Irrigation Design Criteria.

i. Runoff and Overspray. Soil types and infiltration rate shall be considered when designing irrigation systems. All irrigation systems shall be designed to avoid runoff, low-head drainage, overspray, or other similar conditions where water flows onto adjacent property, nonirrigated areas, walks, roadways or structures. Proper irrigation equipment and schedules, including features such as repeat cycles, shall be used to closely match application rates to infiltration rates therefore minimizing runoff. Special attention shall be given to avoid runoff on slopes and to avoid overspray in planting areas with a width less than ten feet. No overhead sprinkler irrigation systems shall be installed in median strips or islands.
ii. Irrigation Efficiency. For the purpose of determining the maximum applied water allowance, irrigation efficiency is assumed to be 0.75. Mixed irrigation system types shall be designed, maintained and managed to meet or exceed an average of 0.75 efficiency.
iii. Equipment.
(A) Water Meters. Separate landscape water meters shall be installed for all projects except for single-family homes or any project with a landscaped area of less than two thousand five hundred square feet.
(B) Controllers. Automatic control systems (solar or electric) hall be required for all irrigation systems and must be able to accommodate all aspects of the design. Mechanical irrigation controllers are prohibited.
(C) Valves. Plants which require different amounts of water shall be irrigated by separate valves. If one valve is used for a given area, only plants with similar water use shall be used in that area
(D) Anti-drain (check) valves shall be installed in strategic points to prevent low-head drainage.

(E) Sprinkler Heads. Heads shall have application rates appropriate to the plant water use requirements within each control valve circuit. Sprinkler heads shall be selected for proper area coverage, application rate, matched precipitation rate nozzles, operating pressure, adjustment capability and ease of maintenance.

(F) Scheduling Aids—Soil Moisture Sensing Devices. It is required that soil moisture sensing devices be installed on all turfgrass sites exceeding 1.0 acres (43,560 square feet) of planted area.

(G) Scheduling Aids—ETo Controllers. It is recommended that ETo controllers be considered for installation on all sites.

(H) Equipment in Publicly Maintained Areas. Irrigation equipment in areas which may or will be maintained by the city shall conform to specifications of the city.

(I) Emitters. Emitters shall have consistent application rates appropriate to the plant water use requirements within each control valve circuit. Emitters shall be selected for specific area coverage (individual plants), application rates, operating pressure, adjustment capability and ease of maintenance.

b. Recycled Water.

i. The installation of recycled water irrigation systems (dual distribution systems) shall be required to allow for the current and future use of recycled water, unless a written exemption has been granted as described in the subsection (C)(6)(b)(ii) of this section.

ii. Irrigation systems shall make use of recycled water unless a written exemption has been granted by the water district having jurisdiction, stating that recycled water meeting all health standards is not available and will not be available in the foreseeable future.

iii. Recycled water irrigation systems shall be designed and operated in accordance with all local and state codes and be applicable to all of the provisions of this chapter.

c. Irrigation Design Plan Specifications.

Irrigation systems shall be designed to be consistent with hydrozones. The irrigation design plan shall be drawn on project base sheets. It shall be separate from, but use the same format as, the landscape design plan. The scale shall be the same as that used for the landscape design plan. The irrigation design plan shall accurately and clearly identify:

i. Location and size of separate water meters for the landscape;

ii. Location, type, and size of all components of the irrigation system, including automatic controllers, main and lateral lines, valves, sprinkler heads, moisture sensing devices, rain switches, quick couplers, and backflow prevention devices;

iii. Static water pressure at the point of connection to the water supply;

iv. Flow rate (gallons per minute), application rate (inches per hour), and design operating pressure (psi) for each station;

v. Recycled water irrigation systems.

G. Grading Design Plan.

Grading design plans satisfying the city/county grading ordinance and the following conditions shall be submitted as part of the landscape documentation package.

a. A grading design plan shall be drawn on project base sheets. It shall be separate from but use the same format as the landscape design plan.

b. The grading design plan shall indicate finished configurations and elevations of the landscaped area, including the height of graded slopes, drainage patterns, pad elevations, and finish grade.

H. Soil Analysis.

A soil analysis satisfying the following conditions should be submitted as part of the landscape documentation package:

a. Determination of soil texture, indicating the available water holding capacity.

b. An approximate soil infiltration rate (either) measured or derived from soil texture/infiltration rate tables. A range of infiltration rates shall be noted where appropriate.

c. Measure of pH and total soluble salts.

I. Certification.

a. A licensed landscape architect, designer of record or designated city staff shall conduct a final field observation and shall provide a certificate of substantial completion to the city. The certificate shall specifically indicate that plants were installed as specified, that the irrigation system was installed as designed, and that an irrigation audit has been performed, along with a list of any observed deficiencies.

b. Certification shall be accomplished by completing a certificate of substantial completion and delivering it to the city, to the retail water supplier, and to the owner of record. A sample of such a form, which shall be provided by the city is:

EXAMPLE CERTIFICATE OF SUBSTANTIAL COMPLETION

Project Site:______________________ Project Number:__________________

Project Location:____

Preliminary Project Documentation Submitted: (Check indicating submittal)

____1. Total Maximum Applied Water Allowance:

______ (100 cubic feet/year)

____2. Estimated Applied Water Use by Hydrozone:

Turfgrass: _______ 100 cubic feet/year

Recreational Turfgrass: _______ 100 cubic feet/year

Exotic Trees/Shrubs/Groundcovers: _______ 100 cubic feet/year

Desert Plants: _______ 100 cubic feet/year

Water features: _______ 100 cubic feet/year

Other ______________________: _______ 100 cubic feet/year

____3. Estimated Total Water Use:
_______ (100 cubic feet/year)

____4. Landscape Design Plan
____5. Irrigation Design Plan
____6. Grading Design Plan
____7. Soil Analysis (optional)

Post-Installation Inspection: (Check indicating substantial completion):

____A. Plants installed as specified
____B. Irrigation system installed as designed
____dual distribution system for recycled water
____minimum run-off or overspray

____Project submittal package and a copy of this certification has been provided to owner/manager and local water agency.

Comments:

I/we certify that work has been installed in accordance with the contract documents:

Contractor	Signature	Date	State License Number

I/we certify that based upon periodic site observations, the work has been substantially completed in accordance with the Water Efficient Landscape Ordinance and that the landscape planting and irrigation installation conform with the approved plans and specifications.

Landscape Architect	Signature	Date	State License Number

or Irrigation Designer/Consultant
or Licensed or Certified Professional in a Related Field

I/we certify that I/we have received all of the contract documents and that it is our responsibility to see that the project is maintained in accordance with the contract documents.

Owner	Signature	Date

(Zoning Ord. dated 1/31/06, § 9108.07(3).)

17.32.100 Public education.

A. Publications.

1. The city will, upon request, provide information to owners of all new, single family residential homes regarding the design, installation, and maintenance of water efficient landscapes.

2. Information about the efficient use of landscape water shall be provided to water users throughout the community.

B. Model Homes. At least one model home that is landscaped in each project consisting of eight or more homes shall demonstrate via signs and information, the principles of water efficient landscapes described in this chapter.

1. Signs shall be used to identify the model as an example of a water efficient landscape and featuring elements such as hydrozones, irrigation equipment, and others which contribute to the overall water efficient theme.

2. Information shall be provided about designing, installing, and maintaining water efficient landscapes. (Zoning Ord. dated 1/31/06, § 9108.07(4).)

17.32.110 Provisions for existing landscapes.

A. Water Management. All existing landscaped areas which use ground water and are over sixty thousand square feet, including golf courses, green belts, common areas, multifamily housing, schools, businesses, parks, and cemeteries shall have a landscape irrigation audit at least every five years unless granted an exemption by the City. At a minimum, the audit shall be in accordance with the California Landscape Irrigation Auditor Handbook, the entire document which is hereby incorporated by reference. (See Landscape Irrigation Audit Handbook, Department of Water Resources, Water Conservation Office (June, 1990), Version 5.5.)

B. Water Waste Prevention. Water waste resulting from inefficient landscape irrigation including run-off, low head drainage, overspray, or other similar conditions where water flows onto adjacent property, nonirrigated areas, walks, roadways, or structures shall be discouraged. Penalties for violation of these prohibitions shall be established. (Zoning Ord. dated 1/31/06, § 9108.07(5).)

17.32.120 Fees for initial review and program monitoring.

A. Fees for the purposes of meeting obligations under this chapter, the following fees are deemed necessary to review landscape documentation packages and monitor landscape irrigation audits and shall be imposed on the subject applicant, property owner or designee.

1. A landscape documentation package review fee will be due at the time initial project application submission to the planning and development department.

2. The project owner/developer must cause a landscape irrigation audit to be completed by a certified landscape irrigation auditor. No city fees will be due for the review of the audit by the planning and development department.

3. If a landscape documentation package is not submitted prior to the start of landscape construction work, for those persons required to submit a package, a late submittal fee of twice the review fee shall be required.

B. The city council, by resolution, shall establish the amount of the above fees in accordance with applicable law. (Zoning Ord. dated 1/31/06, § 9108.07(6).)

17.32.130 Appeals.

Decisions made by the Director may be appealed by an applicant, property owner(s), or designee(s) of any applicable project to the planning commission and thereafter the city council by an application in writing to the planning and development director and city clerk of the city council respectively within fifteen days from the date of notification of decision. (Zoning Ord. dated 1/31/06, § 9108.07(7).)

Article IV.
Landscape Design Guidelines

17.32.140 Purpose.

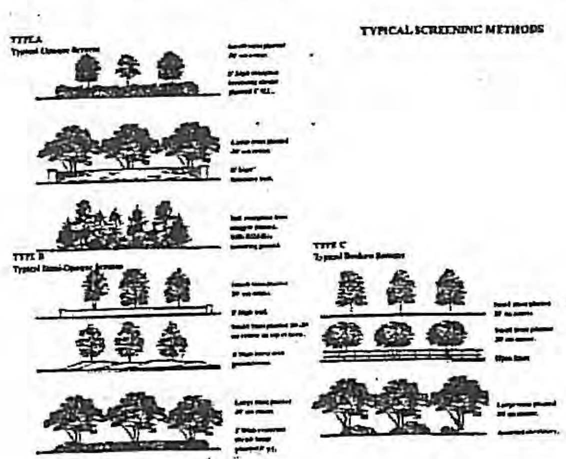
The design guidelines which follow are a reference to assist the designer in understanding the City's objectives for high quality landscaping. These guidelines will be utilized during the design review process to encourage the highest level of design quality while at the same time providing the necessary flexibility to encourage creativity on the part of the project designers. (Zoning Ord. dated 1/31/06, § 9108.09(1).)

17.32.150 Applicability.

Any addition, remodelling, relocation or construction requiring a building permit subject to review by the Community Development Department, shall adhere to these guidelines unless exempted. (Zoning Ord. dated 1/31/06, § 9108.09(2).)

17.32.160 General guidelines.

A. Landscaping and open spaces should be designed as a central part of the site design, and should integrate development with the surrounding elements of the natural environment. Landscaping should enhance building design, public views and spaces, provide buffers and transitions, preserve and enhance wildlife habitat, provide shade and cooling, and provide screening from other nearby uses.



B. Landscape design should highlight the design theme through the use of arbors and trellises.

C. Landscaped areas should incorporate grasses and groundcovers; shrubs; and trees.

D. The following planting design concepts should be used whenever possible:

1. Trees to create canopies and shade, especially in parking areas;

2. Pots, vases, wall planters and raised planters;

3. Specimen trees used in informal groupings and rows at major focal points;

4. The use of flowering trees in informal groups to provide color;

5. The use of distinctive plants as focal points;

6. Berms, plantings and low walls to screen parking areas from public rights of way.

E. Landscaping should be installed at the base of buildings. Asphalt edges should be avoided.

F. Plantings should be planned to create a simple, non-uniform arrangement. (Zoning Ord. dated 1/31/06, § 9108.09(3).)

17.32.170 Installation and maintenance.

A. Trees, shrubs and vines should have body and fullness that is typical of the species.

B. Herbaceous and flat plant groundcovers should be planted no more than 12 inches on center, and woody, shrub groundcover should be planted no more than 3 feet on center.

C. Plant materials should be spaced so they do not interfere with lighting, and so they do not restrict access to fire hydrants or fire alarm boxes. Proper spacing should insure unobstructed access for vehicles and pedestrians. The following spacing standards should be used:

Use a variety of techniques to buffer non-residential uses.

1. 25 feet from the property corner at a street intersection to the center of the first tree or large shrub.

2. 15 feet between trees and large shrubs.

3. 15 feet between trees or large shrubs and fire hydrants.

4. 10 feet between trees or large shrubs and the edge of any driveway. (Zoning Ord. dated 1/31/06, § 9108.09(4).)

Chapter 13.16

WATER CONSERVATION

Sections:

13.16.010 Urban water management/conservation plan.

The City of Banning adopts the urban water management/conservation plan, a copy of which is on file in the office of the city clerk. (Code 1965, § 31-6.)

13.16.020 Restricting water use during water supply emergencies.

A. Definitions. As used in this section:

"Agency" means City of Banning.

"Council" means city council of the city.

"Emergency supply shortage" means any water shortage caused by an earthquake, loss of electrical power, pipe line breakage, or any other threatened or existing water shortage caused by a disaster or facility failure which results in city inability to meet the water demands of its customers.

"Water operations superintendent" means the water services supervisor of the city.

"Waste" means any unreasonable or nonbeneficial use of water, or any unreasonable method of use of water, as determined by the council, including, but not limited to, the specific uses prohibited and restricted by this section as hereinafter set forth.

"Water users" means any person, firm, partnership, association, corporation or political entity using water obtained from the water system of the city.

"Water" means water supplied by the city.

B. Noticed public hearing prior to mandatory conservation. Except when an emergency is caused by the breakage or failure of a dam, pump, pipeline or conduit, a noticed public hearing shall be held prior to the adoption of stages 2, 3 or 4 of the water supply plan for emergency supply shortage as set forth in subsections (C)(2), (C)(3) and (C)(4) of this section. Notice of the time and place of hearing shall be published at least seven days prior to the date of hearing in a newspaper printed, published, and circulated within the area in which the water supply is distributed, or if there is no such newspaper, in any newspaper printed, published, and circulated in the county in which the area is located.

C. Water supply plan for emergency supply shortage.

1. Stage No.1. Normal conditions: voluntary conservation measures. Normal conditions shall be in effect when the city is able to meet all the water demands of its customers in the immediate future. During normal conditions, all water users should continue to use water wisely, to prevent the waste or unreasonable use of water, and to reduce water consumption to that necessary for ordinary domestic and commercial purposes.

2. Stage No. 2. Water shortage alert: mandatory conservation measures. In the event of a sudden and unexpected water supply shortage which could prevent the city from meeting the water demands of its customers, the council shall immediately hold a public hearing at which consumers of the water supply shall have the opportunity to protest and to present their respective needs to the council. No public hearing shall be required in the event of a breakage or failure of a dam, pump, pipeline or conduit causing an immediate emergency. The council may then declare a water shortage emergency condition to prevail, and the following rules and regulations shall be in effect immediately following such declaration.

a. Washing driveways, parking lots, or other hard surfaced area, or building exteriors at any time, except to alleviate immediate fire hazards is prohibited;

b. Parks, golf courses and school grounds are to be irrigated during nighttime hours only, between sunset and sunrise;

c. Lawn watering and landscape irrigating, including construction meter use, is prohibited between the hours of 10:00 A.M. to 5:00 P.M.;

d. Running water shall not be used for washing privately owned vehicles. A bucket may be used for the washing of vehicles and only hoses equipped with shut-off nozzles may be used for rinsing;

e. Restaurants are requested not to provide drinking water to patrons except by request;

f. Commercial nurseries shall use water only during the hours from midnight to 6:00 A.M. Irrigation of propagation beds and watering of livestock is permitted as necessary during any hours.

g. Golf courses using reclaimed water are exempted from these restrictions.

3. Stage No. 3. Water shortage warning. The council may, following a public hearing as set forth in subsection B of this section, declare that an emergency water supply shortage exists, and that the agency is unable to meet all the water demands of its customers. Immediately thereafter, the following water conservation measures shall apply:

a. Parks and schools shall be watered on alternate days during the hours between sunset to sunrise, the schedule of which shall be set following the public hearing;

b. Golf courses which utilize domestic water from the city's domestic system may irrigate greens only during the hours between sunset to sunrise. Golf courses utilizing reclaimed water are exempted from this restriction;

c. Other lawn watering and landscape irrigating, including construction meter use, are restricted as follows: customers with even-numbered street addresses may water only on even-numbered days, customers with odd- numbered street addresses may water only on odd-numbered days, and no watering or irrigating shall be done between the hours of 10:00 A.M. and 5:00 P.M. on any day;

d. Washing down of driveways, parking lots, or other paved surfaces is prohibited;

e. Washing of vehicles is restricted to commercial car wash establishments which recycle their water;

f. Filling or adding water to swimming pools, wading pools, spas, ornamental ponds, fountains and artificial lakes is prohibited;

g. Restaurants shall not serve drinking water to patrons except by request;

h. No new construction meter permits shall be issued by the agency;

i. Construction metered water shall not be used for earth work or road construction purposes;

j. Water of livestock is permitted as necessary during any hours;

k. Commercial nurseries may use water only between the hours of midnight and 6:00 A.M. Irrigation of propagation beds is permitted as necessary during any hours. Commercial nurseries utilizing reclaimed water are exempted from this restriction.

4. Stage No. 4. Mandatory compliance. Water shortage emergency.

Following a declaration by the city council that an emergency water supply shortage due to a major failure in a supply of distribution facility exists, the following water conservation measures shall apply:

a. Watering of parks, school grounds and golf courses is prohibited, except by reclaimed water;

b. Watering of lawn and irrigating of landscape is prohibited;

c. Washing down of driveways, parking lots, or other paved surfaces is prohibited;

d. Washing of vehicles is prohibited, except when done by commercial car wash establishments using recycled or reclaimed water;

e. Filling or adding water to swimming pools, wading pools, spas, ornamental ponds, fountains and artificial lakes is prohibited;

f. No serving of drinking water by restaurants to patrons except by request;

g. No issuing of new construction meter permits by the city;

h. Turning off and locking all existing construction meters;

i. Discontinuing all watering and irrigating of commercial nurseries. Those utilizing reclaimed water are exempted from this restriction. Watering of livestock is permitted as necessary.

D. Council discretion to modify conservation measures upon a showing of necessity therefor. The specific requirements of each mandatory conservation stage shall be effective upon adoption by the council following a public hearing, except that the council may modify or amend such requirements at the time of adoption upon a showing of the need for such modification or amendment.

E. Implementation and termination of mandatory compliance stages. The water operations superintendent of the city shall monitor the supply and demand for water on a daily basis to determine the level of conservation required by the implementation or termination of the water conservation stages, and shall notify the council of the necessity for the implementation or termination of each stage. Each declaration of the council implementing or terminating a water conservation stage shall be published at least once in a newspaper of general circulation, and shall remain in effect until the city council otherwise declares, as provided herein.

F. Exceptions. Application for exception permit. The water operations superintendent of the city may grant permits for uses of water otherwise prohibited thereby if he/she finds and determines that special circumstances make compliance not reasonably possible, or that restrictions herein would either:

1. Cause an unnecessary and undue hardship to the water user or the public; or

2. Cause an emergency condition affecting the health, sanitation, fire protection or safety of the water user or of the public.

Such exceptions may be granted only upon application therefor. Upon granting any such exception permit, the water operations superintendent may impose any conditions he/she determines to be just and proper.

G. Criminal proceedings for violation. The city council hereby declares that, pursuant to Water Code Section 377, it shall be a misdemeanor for any person to use or apply water contrary to or in violation of any mandatory restriction or requirement established by this section and, upon conviction thereof, that person, firm or corporation shall be punished by imprisonment in the county jail for not more than thirty days or a fine of not more than one thousand dollars or by both such fine and imprisonment.

H. Civil proceedings for violation. In addition to criminal penalties, violators of the mandatory provisions of this section shall be subject to civil action initiated by the city.

1. First violation. For a first violation, the city shall issue a written notice of violation to the water user violating the provisions of this chapter.

2. Second violation: twenty-five percent surcharge. For a second violation of this section within a twelve-month period, a one-month surcharge is hereby imposed in an amount equal to twenty-five percent of the previous month's water bill for the meter through which the wasted water was supplied.

3. Third violation: fifty percent surcharge; installation of flow restrictor. For a third violation of this section within a twelve-month period, a one-month penalty surcharge is hereby imposed in an amount equal to fifty percent of the previous month's water bill for the meter through which the wasted water was supplied. In addition to the surcharge, the agency may at its discretion install a flow-restricting device at such meter with a one-eighth-inch orifice for services up to one and one-half inch size, and comparatively sized restrictors for larger services, on the service of the customer at the premises at which the violation occurred, for a period of not less than forty-eight hours. The charge for installing a flow-restricting device shall be based upon the size of the meter and the cost of installation but shall not be less than twenty-five dollars. The charge for removal of the flow-restricting device and restoration of normal service shall be twenty-five dollars if restoration of normal service is performed during the hours of 7:00 A.M. to 3:30 P.M. on regular working days. If the removal of the flow-restricting device and restoration of normal service is made after regular working hours, on holidays or weekends, the restoration service charge shall be forty dollars.

4. Subsequent violations; discontinuance of service. For any subsequent violation of this section within the twenty-four calendar months after a first violation as provided in subsection (H)(1) of this section, the penalty surcharge provided in subsection (H)(3) of this section shall be imposed and the city shall discontinue water service to that customer at the premises or to the meter where the violation occurred. The charge for reconnection and restoration

of normal service shall be twenty-five dollars. Such restoration of service shall not be made until the water operations superintendent of the city has determined that the water user has provided reasonable assurances that future violations of this section by such user will not occur.

I. Notice.

1. For a first violation, written notice may be given to the customer personally or by certified mail.

2. If the penalty assessed is a surcharge for a second or third violation, notice may be given by certified mail.

3. If the penalty assessed is, or includes, the installation of a flow restrictor or the discontinuance of water service to the customer for any period of time whatever, notice of the violation shall be given in the following manner:

a. By giving written notice thereof by certified mail or to the customer personally; or

b. If he/she is absent from his/her place of residence and from his/her assumed place of business, by leaving a copy with some person of suitable age and discretion at either place, and sending a copy through the United States mail, certified, addressed to the customer at either his/her place of business or residence; or

c. If such place of residence and business cannot be ascertained, or a person of suitable age or discretion cannot be found, then by affixing a copy in a conspicuous place on the property where the failure to comply is occurring and also by delivering a copy to a person residing, if such person can be found, and also sending a copy through the United States mail, certified, addressed to the customer at the place where the property is situated.

4. Any notice provided hereunder shall contain, in addition to the facts of the violation, a statement of the possible penalties for each violation and a statement of the possible penalties for each violation and a statement informing the customer of his right to a hearing on the violation.

J. Hearing. Any customer against whom a penalty is levied pursuant to subsections G and H of this section shall have a right to a hearing, in the first instance by the water operations superintendent, with the right of appeal to the city council, on the merits of the alleged violation upon the written request of that customer within fifteen days of the date of infraction of the violation.

K. Reservation of rights. The rights of the city hereunder shall be cumulative to any other right of the city to discontinue service. All moneys collected by the department pursuant to any of the penalty provisions of this chapter shall be deposited in the operating fund as reimbursement for the city's costs and expenses of administering and enforcing this section.

L. Concurrent authority. The city manager, its water operations superintendent and designated employees, have the duty and are hereby authorized to enforce all provisions of this section, with the qualification that the city through enforcement of this section, the county as to unincorporated territory within the city, are recognized to have concurrent authority for, and shall have the primary responsibility for the control of water flowing in the streets where such occurs within their respective jurisdictions. (Code 1965, § 31-7.)

13.16.030 Water conservation using xeriscape principles.

A. Intent. Water is an increasingly limited and costly resource. It is the intent of this section to establish a water conservation plan to reduce water consumption in the landscape environment using xeriscape principles.

B. Definitions.

"Low water-using drought tolerant plant" includes species suited to our climate, requiring less water in order to grow well.

"Xeriscape" shall mean a combination of landscape features and techniques that in the aggregate reduce the demand for and consumption of water, including appropriate low water using plants, nonliving ground-cover, a low percentage of turf coverage, permeable paving and water conserving irrigation techniques and systems.

C. Applicability. The provisions of this section shall apply to all developments within the city including, but not limited to, the following:

1. All new residential developments (including townhomes and apartment projects) on parcels greater than seven thousand square feet;

2. Rehabilitated landscaping (for projects on parcels greater than ten thousand square feet) for industrial, commercial, institutional, multifamily and residential common areas of PUDs (Planned Unit Developments);

3. Interior remodels, tenant improvements and demolitions for any of the above projects;

4. Schools, parks, golf courses or similar public open spaces;

5. Water conservation landscape requirements shall apply to all new developments. New development applications shall include landscape plans which require final approval at the time of final project approval.

D. Exceptions. The provisions of this section shall not apply to those projects which have been approved or accepted as complete for processing prior to the effective date of the ordinance codified in this section; provided no material amendments or extensions are made to such previously approved projects. These provisions shall also not apply to the following:

1. Homeowner-provided landscaping at single-family and multifamily projects;

2. Cemeteries;

3. Registered historical sites;

4. Ecological restoration projects that do not require a permanent irrigation system;

5. Mined-land reclamation projects that do not require a permanent irrigation system.

E. Requirements.

1. Turf limitation. The maximum allowed turf and/or water area (expressed as percent of planted area) shall be twenty-five percent for industrial, commercial, residential developments with common area, institutions and public/semi-public developments. If turf is an essential part of development, such as playing fields for schools or public parks, a higher percentage will be allowed, and will be evaluated on an individual basis. No turf shall be allowed in median strips or in areas less than eight feet wide.

If a residential development has one or more model homes, it is required that at least one model home in the development be planted with drought tolerant plants and a maximum of twenty-five percent turf and/or water area. Additionally, developers shall provide buyers with sample landscape plans using low water-using plants and a maximum twenty-five percent turf area. The developer shall also provide information about outdoor water conservation by distributing pamphlets to buyers regarding this subject. Such pamphlets are available from local water districts and the state department of water resources. The county community development department will have samples of appropriate types of pamphlets available. Landscape and distribution of literature shall require approval by the community development department.

2. Types of plants in non-turf areas. At least ninety percent of the plants in non-turf areas shall be low water-requiring, drought-resistant plants as approved by the community development department. A small percentage of the planted area (up to ten percent) can be used for nondrought tolerant varieties if they are grouped together and can be irrigated separately.

3. Use of mulch. A minimum of two inches of mulch shall be added to the soil surface after planting. Nonporous material shall not be placed under the mulch.

4. Irrigation.

a. Sprinklers and sprays shall not be used in areas less than eight feet wide. Drip and bubbler shall be used that do not exceed one and one-half gallons per minute per device.

b. Sprinkler heads with a precipitation rate of .85" per hour or less shall be used in slopes exceeding fifteen percent to minimize runoff, or exceeding ten percent within ten feet of hardscape.

c. Valves and circuits shall be separated based on water use.

d. Drip or bubbler irrigation systems are required for trees with the exception of those which can be sustained by ground or rain water.

e. Sprinkler heads must have matched precipitation rates within each control valve circuit.

f. Serviceable check valves are required where elevation differential may cause low head drainage.

g. Sprinkler head spacing shall be designed for head-to-head coverage. The system should be designed for minimum runoff and overspray onto nonirrigated areas.

h. All irrigation systems shall be equipped with a controller capable of dual or multiple programming. Controllers must have multiple cycle start capacity and a flexible calendar program.

5. Ornamental ponds. Water bodies that are part of the landscaping for new developments shall be restricted. Unless the water body is an integral part of the operations of the new development, the surface area of the water body shall be counted as turf in the calculations for limitation of turf for the landscaped area. Fountains or other types of decorative bodies where water is sprayed into the air shall be discouraged. Some allowance will be made for fountains for ponds where reclaimed irrigation is used and the water supply is recirculated.

6. Landscape plans. Landscape plans shall indicate the total landscape area, the area and percentage of drought-resistant plantings and the area and percentage of ornamental nondrought resistant plantings. The plans shall be reviewed by community development director or his designee to check for compliance with this section in regards to plant varieties, planting areas and irrigation design. Commercial, multiple dwellings, country clubs and condominiums shall be required to submit additional landscape plans which include a water budget that incorporates estimated annual water use (in gallons) and the area (in square feet) to be irrigated. Precipitation rates for each valve circuit and a monthly irrigation schedule for the plant establishment period including the year following shall be supplied as well. (Code 1965, § 31-8.)

Chapter 13.24

STORMWATER MANAGEMENT SYSTEM

Sections:

13.24.010 Title.

The ordinance codified in this chapter shall be known as the City of Banning stormwater management and discharge control ordinance and may be so cited. (Code 1965, § 34-1.)

13.24.020 Purpose and intent.

The purpose of this chapter is to ensure the future health, safety, and general welfare of the citizens by:

A. Regulating nonstormwater discharges to the municipal separate storm drain; and

B. Controlling the discharge to municipal separate storm drains from spills, dumping or disposal of materials other than stormwater; and

C. Reducing pollutants in stormwater discharges to the maximum extent practicable.

The intent of this chapter is to protect and enhance the water quality of city watercourses, water bodies, groundwater, and wetlands in a manner pursuant to and consistent with the Clean Water Act. (Code 1965, § 34-2.)

13.24.030 Definitions.

The terms as used in this chapter shall have the following meanings:

A. Best Management Practice (BMP). "BMPs" means schedules of activities, prohibitions of practices, general good housekeeping practices, maintenance procedures, educational programs, and other management practices to prevent or reduce the discharge of pollutants directly or indirectly to waters of the United States. BMPs shall include treatment requirements, operating procedures, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, and drainage from raw materials storage. The California Stormwater Best Management Practice Handbooks for Municipal, Industrial/Commercial and Construction Activity provide a detailed discussion of BMPs.

B. "Director" means the director of the public works department, City of Banning.

C. "Enforcement officer" includes the director of public works, building official, code enforcement officer, city manager and their designees.

D. "Illicit connection" means any physical connection to a storm drain system which has not been permitted by the City of Banning, the Riverside County Flood Control and Water Conservation District, or other appropriate public agency.

E. "Illicit discharge" means any discharge to the storm drain system that is not composed entirely of stormwater runoff except discharges made pursuant to a National Pollutant Discharge Elimination System (NPDES) permit or as otherwise authorized by the Santa Ana or Colorado River Basin Regional Water Quality Control Board.

F. "Municipal NPDES permit" means an area-wide NPDES permit issued to a government agency or agencies for the discharge of stormwater from a stormwater system.

G. "National Pollutant Discharge Elimination System (NPDES) permit" means a stormwater discharge permit issued by the Santa Ana or Colorado River Basin Regional Water Quality Control Board in compliance with the federal Clean Water Act.

H. "Nonstormwater discharge" means any discharge to the storm drain system that is not entirely composed of stormwater.

I. "Person" means any natural person, firm, association, club, organization, corporation, partnership, business trust, company or other entity which is recognized by law as the subject of rights or duties.

J. "Pollutant" means anything which causes the deterioration of water quality such that it impairs subsequent and/or competing uses of the water. Pollutants may include but are not limited to paints, oil and other automotive fluids, soil, rubbish, trash, garbage, debris, refuse, waste, fecal coliform, fecal streptococcus, enterococcus, heavy metals, hazardous waste, chemicals, fresh concrete, yard waste from commercial landscaping operations, animal waste, materials that result from the process of constructing a building or structure, nauseous or offensive matter of any kind.

K. "Premises" means any building, lot, parcel of land, or portion of land whether improved or unimproved.

L. "Storm drain system" means any facility by which storm water may be conveyed to waters of the United States. The storm drain system includes but is not limited to any roads with drainage systems, streets, curbs, gutters, catch basins, natural and artificial channels, ditches, aqueducts, storm drains, inlets, conduit or other drainage structures.

M. "Stormwater runoff" means surface runoff and drainage associated with rainstorm events and snow melt. (Code 1965, § 34-3.)

13.24.040 Responsibility for administration.

This chapter shall be administered for the city by the director of public works. (Code 1965, § 34-4.)

13.24.050 Regulatory consistency.

This chapter shall be construed to assure consistency with the requirements of the federal Clean Water Act and acts amendatory thereof or supplementary thereto, applicable implementing regulations, and any existing or future municipal NPDES permits and any amendments, revisions or reissuance thereof. (Code 1965, § 34-5.)

13.24.060 Discharge of pollutants.

A nonstormwater discharge to the storm drain system is a violation of this chapter.

A. The prohibition of discharges shall not apply to any discharge regulated under a NPDES permit or waiver issued to the discharger and administered by the state of California under the authority of the EPA, provided that the discharger is in full compliance with all requirements of the permit or waiver and other applicable laws or regulations.

B. Discharges from the following activities will not be considered a source of pollutants to waters of the United States when properly managed: water line flushing and other discharges from potable water sources, landscape irrigation and lawn watering, irrigation water, diverted stream flows, rising groundwaters, infiltration to separate storm drains, uncontaminated pumped ground water, foundation and footing drains, water from crawl space pumps, air conditioning condensation, springs, individual residential car washing, flows from riparian habitats and wetlands, dechlorinated swimming pool discharges or flows from fire fighting. (Code 1965, § 34-7.)

13.24.070 Discharge in violation of permit.

A. Any discharge that results in or contributes to a violation of an existing or future municipal NPDES permit(s) and any amendment, revision or reissuance thereof, either separately considered or when combined with other discharges, is a violation of this chapter and is prohibited.

B. Liability for any such discharge shall be the responsibility of the person(s) causing or responsible for the discharge, and such persons shall defend, indemnify and hold harmless the city in any administrative or judicial enforcement action relating to such discharge.

C. A copy of the current municipal NPDES permit will be filed in the city engineer's office. (Code 1965, § 34-8.)

13.24.080 Illicit connections.

It is a violation of this chapter to establish, use, maintain, or continue an illicit connection to the city storm drain system, or to commence or continue any illicit discharge to the city storm drain system. The prohibition against illicit connections is expressly retroactive and applies to connections made in the past, regardless of whether permissible under the law or practices applicable or prevailing at the time of the connection. (Code 1965, § 34-9.)

13.24.090 Reduction of pollutants in stormwater.

A. It is a violation of this chapter to throw, deposit, leave, maintain, keep, or permit to be thrown, deposited, placed, left or maintained, any pollutant, including but not limited to refuse, rubbish, garbage, abandoned vehicles or other discarded or abandoned objects, articles, and accumulation, in or upon any street, alley, sidewalk, storm drain, inlet, catch basin, conduit or other drainage structures, business place, or upon any public or private plot of land in the city.

B. It is an exception to the above that such pollutant is being temporarily placed in an appropriate container with a spill containment system for later collection and removal.

C. It is a violation of this chapter to cause or permit any Dumpster, solid waste bin, or similar container to leak such that any pollutant is discharged into any street, alley, sidewalk, storm drain, inlet, catch basin, conduit or other drainage structures, business place, or upon any public or private plot of land in the city. (Code 1965, § 34-10.)

13.24.100 Outdoor storage areas—Commercial and industrial facilities.

A. It is a violation of this chapter for any person to improperly store grease, oil or other hazardous substances in outdoor areas. In outdoor areas, no person shall improperly store motor vehicles, machine parts, or other objects in a manner that may leak grease, oil, or other hazardous substances.

B. To prevent the discharge of hazardous substances from the property, the city may require the installation of a spill containment system. Spill containment systems may consist of a system of dikes, walls, barriers, berms, or other devices as required.

C. It is a violation of this chapter for any person to operate a spill containment system such that it allows incompatible liquids to mix and thereby create a hazardous condition. (Code 1965, § 34-11.)

13.24.110 Construction sites.

Any person performing construction work in city shall comply with the provisions of this chapter, and the Uniform Building Code, latest edition, for erosion and sediment control. (Code 1965, § 34-12.)

13.24.120 New development and redevelopment.

A. Any new development or redevelopment project shall control the volume and rate of stormwater runoff from the project so as to prevent any deterioration of water quality which would impair the subsequent or competing uses of the water. The director of the public works department shall establish standards and guidelines implementing BMPs designed to control the rate and volume of stormwater runoff from new developments and redevelopments as may be appropriate to minimize the discharge and transport of pollutants.

B. Acceptable methods and standards for controlling stormwater runoff volumes, rates, and pollutant load may include but are not limited to the following:

1. Increase Permeable Areas. Avoid placing impervious surfaces in highly porous soil areas; incorporate landscaping and open space into the project design; use porous materials for or near driveways and walkways; incorporate detention ponds and infiltration pits into the project's design; avoid placing pavement and other impervious surfaces in low lying areas.

2. Direct Runoff to Permeable Areas. Direct stormwater runoff away from impermeable areas to swales, berms, green strip filters, gravel beds, and french drains. Install raingutters and orient them toward permeable areas. Modify the grade of the property to divert flow to permeable areas and minimize the amount of stormwater runoff leaving the property. When designing curbs, berms or other structures, avoid designs which isolate permeable or landscaped areas.

3. Maximize Stormwater Storage for Reuse. Use retention structures, subsurface areas, cisterns, or other structures to store stormwater runoff for reuse or slow release. (Code 1965, § 34-13.)

13.24.130 Compliance with general permits.

A. Any industrial discharger, discharger associated with construction activity, or other discharger subject to any NPDES permit issued by the United States Environmental Protection Agency, the State Water Resources Control Board, the Santa Ana Regional Water Quality Control Board or the Colorado River Basin Regional Water Quality Control Board, shall comply with all requirements of such permit.

B. Proof of compliance with said NPDES general permits may be required in a form acceptable to the director prior to issuance of any city grading, building, or occupancy permits. (Code 1965, § 34-14.)

13.24.140 Compliance with BMPs.

Where BMP guidelines or requirements have been adopted by any federal, state of California, regional, and/or local agency, for any activity, operation, or facility which may cause or contribute to stormwater pollution or contamination, illicit discharges, and/or discharge of nonstormwater to the stormwater system, every person undertaking such activity or operation, or owning or operating such facility shall comply with guidelines or requirements as may be identified by the director. (Code 1965, § 34-15.)

13.24.150 Authority to inspect.

A. Whenever necessary to make an inspection to enforce any of the provisions of this chapter or whenever an authorized enforcement officer has reasonable cause to believe that there exists in any building or upon any premises any condition which constitutes a violation of the provisions of this chapter, the enforcement officer may enter such building or premises at all reasonable times to inspect the same or perform any duty imposed upon the enforcement officer by this chapter.

B. Entry hereunder shall be subject to the following:

1. If such building or premises be occupied, he or she shall first present proper credentials and request entry; and

2. If such building or premises be unoccupied, he or she shall first make a reasonable effort to locate the owner or other persons having charge or control of the building or obtain a warrant to enter.

C. Any request for entry made hereunder shall state that the property owner or occupant has the right to refuse entry and that in the event such entry is refused, inspection may be made only upon issuance of a search warrant by a duly authorized magistrate. In the event the owner and/or occupant refuses entry after such request has been made, the official is empowered to seek assistance from any court of competent jurisdiction in obtaining such entry.

D. Routine or area inspections shall be based upon such reasonable selection processes as may be deemed necessary to carry out the objectives of this chapter, including but not limited to random sampling and/or sampling in areas with evidence of stormwater contamination, illicit discharges, discharge of non-stormwater to the stormwater system, or similar factors. (Code 1965, § 34-16.)

13.24.160 Authority to sample and establish sampling devices.

With the consent of the owner or occupant or pursuant to a search warrant, any authorized enforcement officer may establish on any property such devices as are necessary to conduct sampling or metering operations. During all inspections as provided herein, the enforcement officer may take any samples deemed necessary to aid in the pursuit of the inquiry or in the recordation of the activities on-site. (Code 1965, § 34-17.)

13.24.170 Notification of spills.

A. All persons in charge of a facility or responsible for emergency response for a facility are personally responsible to train facility personnel and maintain notification procedures to assure that immediate notification is provided to the city of any suspected, confirmed or unconfirmed release of material, pollutants or waste creating a risk of discharge into the city storm drain system.

B. As soon as any person in charge of a facility or responsible for emergency response for a facility has the knowledge described in subsection A of this section, such person shall take all necessary steps to ensure the discovery, containment, and cleanup of such release, and shall notify the city of the occurrence by telephoning and confirming the notification by correspondence to the director of the public works department and fire department. (Code 1965, § 34-18.)

13.24.180 Requirement to test or monitor.

A. Any authorized enforcement officer may request that any person engaged in any activity and/or owning or operating any facility which may cause or contribute to stormwater pollution or contamination, illicit discharges, and/or discharge of nonstormwater to the stormwater system, undertake such monitoring activities and/or analyses and furnish such reports as the enforcement officer may specify. The burden, including costs, of these activities, analyses and reports shall bear a reasonable relationship to the need for the monitoring, analyses and reports and the benefits to be obtained. The recipient of such request shall undertake and provide the monitoring, analyses and/or reports requested.

B. In the event the owner or operator of a facility subject to a monitoring and/or analyses order fails to conduct required monitoring and/or analyses and furnish the required reports in the form required, the authorized enforcement officer may cause such monitoring and/or analyses to be performed.

1. The cost therefor, including the reasonable additional administrative costs incurred by the city, shall be the responsibility of the owner of the property.

2. The cost thereof shall be invoiced to the owner of the property.

3. If the invoice is not paid within sixty days of the issuance thereof, the costs shall be a lien upon and against the property and continue in existence until the same shall be paid.

4. If the lien is not satisfied by the owner of the property within three months after the completion by an authorized enforcement officer of the required monitoring and/or analyses and reports, the property may be sold in satisfaction thereof in a like manner as other real property is sold under execution. (Code 1965, § 34-19.)

13.24.190 Violations constituting misdemeanors.

A. Unless otherwise specified by ordinance, the violation of any provision of this chapter, or failure to comply with any of the mandatory requirements of this chapter shall constitute a misdemeanor.

B. Notwithstanding any other provisions of this chapter, any such violation constituting a misdemeanor under this chapter, at the discretion of the authorized enforcement officer may be charged and prosecuted as an infraction. (Code 1965, § 34-20.)

13.24.200 Penalties.

A. It shall be unlawful for any person to violate any provision of this chapter.

1. Any person violating any provision of this chapter shall be deemed guilty of an infraction or misdemeanor as hereinafter specified.

2. Such person shall be deemed guilty of a separate offense for each and every day or portion thereof during which any violation of any of the provisions of this chapter is committed, continued, or permitted.

B. Any person so convicted shall be:

1. Guilty of an infraction offense and punished by a fine not exceeding one hundred dollars for a first violation;

2. Guilty of an infraction offense and punished by a fine not exceeding two hundred dollars for a second violation;

3. The third and any additional violations shall constitute a misdemeanor offense and shall be punishable by a fine not exceeding one thousand dollars or six months in jail, or both.

C. Notwithstanding the above, a first offense may be charged and prosecuted as a misdemeanor.

D. Payment of any penalty herein shall not relieve a person from the responsibility for correcting the violation. (Code 1965, § 34-21.)

13.24.210 Concealment.

Causing, permitting, aiding, abetting or concealing a violation of any provision of this chapter shall constitute a violation of such provision. (Code 1965, § 34-22.)

13.24.220 Violations deemed a public nuisance.

A. In addition to the penalties hereinbefore provided, any condition caused or permitted to exist in violation of any of the provisions of this chapter is a threat to the public health, safety and welfare, and may be declared and deemed a nuisance, and may be summarily abated and/or restored by any authorized enforcement officer, and/or civil action to abate, enjoin or otherwise compel the cessation of such nuisance may be taken as authorized by this Code.

B. If any violation of this chapter constitutes a seasonal and recurrent nuisance, the director shall so declare. Thereafter such seasonal and recurrent nuisance shall be abated every year without the necessity of any further hearing.

C. In any administrative or civil proceeding under this chapter in which the city prevails, the city shall be awarded all costs of investigation, administrative overhead, out-of-pocket expenses, costs of administrative hearing, costs of suit and reasonable attorney's fees. (Code 1965, § 34-23.)

13.24.230 Judicial review.

The provisions of Section 1094.6 of the California Code of Civil Procedure are applicable to judicial review of city decisions pursuant to this chapter. (Code 1965, § 34-24.)

13.24.240 Civil actions.

In addition to any other remedies provided herein, this chapter may be enforced by civil action brought by the city. In any such action, the city shall grant, as appropriate, any or all of the following remedies:

A. A temporary and/or permanent injunction;

B. Assessment of the violator for the costs of any investigation, inspection, or monitoring survey which led to the establishment of the violation, and for the reasonable costs of preparing and bringing legal action under this section;

C. Costs incurred in removing, correcting, or terminating the adverse effects resulting from the violation;

D. Compensatory damages for loss or destruction to water quality, wildlife, fish and aquatic life. Assessments under this section shall be paid to the city to be used exclusively for costs associated with monitoring and establishing stormwater discharge pollution control systems and/or implementing or enforcing the provisions of this chapter. (Code 1965, § 34-25.)

13.24.250 Cease and desist orders.

When an authorized enforcement officer finds that a discharge has taken place or is likely to take place in violation of this chapter, the officer may issue an order to cease and desist such discharge, or practice, or operation likely to cause such discharge and direct that those persons not complying shall:

A. Comply with the requirement;

B. Comply with a time schedule for compliance; and/or

C. Take appropriate remedial or preventive action to prevent the violation from recurring. (Code 1965, § 34-26.)

13.24.260 Notice to clean.

A. Whenever an authorized enforcement officer finds any oil, earth, dirt, grass, weeds, dead trees, tin cans, rubbish, refuse, waste or any other material of any kind, in or upon the sidewalk abutting or adjoining any parcel of land, or upon any parcel of land or grounds, which may result in an increase in pollutants entering a city storm sewer system or natural watercourse, or a nonstorm sewer system or natural watercourse, or a nonstorm water discharge to a city storm sewer system or natural watercourse, he or she may give notice to remove such oil, earth, dirt, grass, weeds, dead trees, tin cans, rubbish, refuse, waste or other material, in any manner that he or she may reasonably provide. The recipient of such notice shall undertake the activities as described in the notice.

B. In the event the owner or operator of a facility fails to conduct the activities as described in the notice, the authorized enforcement officer may cause such required activities as described in the notice, and the cost thereof shall be invoiced to the owner of the property.

1. If the invoice is not paid within sixty days, a lien shall be placed upon and against the property.

2. If the lien is not satisfied by the owner of the property within three months after the completion of the required activities by the authorized enforcement officer the property may be sold in a satisfaction thereof in a like manner as other real property is sold under execution. (Code 1965, § 34-27.)

13.24.270 Nonexclusivity of remedies.

Remedies under this chapter are in addition to and do not supersede or limit any and all other remedies, civil or criminal. The remedies provided for herein shall be cumulative and not exclusive. (Code 1965, § 34-28.)

13.24.280 Appeal.

Any person, firm, corporation or organization required to perform monitoring, analyses, reporting and/or corrective activities by an authorized enforcement officer who is aggrieved by the decision of the authorized enforcement officer may appeal such decision to the director within ten days following the effective date of the decision by writing to the director. Upon receipt of such request, the director shall request a report and recommendation from the authorized enforcement officer and shall set the matter for hearing at the earliest practical date. At said hearing, the director may hear additional evidence, and may reject, affirm or modify the authorized enforcement officer's decision. Such decision shall be final unless appealed by the city council under the general appeal procedures of the city. (Code 1965, § 34-29.)

ORDINANCE NO. 1415

AN ORDINANCE OF THE CITY OF BANNING AMENDING THE CODE OF THE CITY OF BANNING, CALIFORNIA, 1965, TITLE 13, CHAPTER 13.24 NOW ENTITLED STORMWATER CODE

WHEREAS, the City of Banning (the "City") duly enacted on June 24, 1997 Ordinance 1212 which is entitled "An Ordinance Of The City Of Banning Adding Chapter 34 To The Banning Ordinance Code Establishing Storm Water Management And Discharge Controls"; and

WHEREAS, the City codified Chapter 34 of Ordinance 1212 in the Banning Municipal Code through Chapter 13.24 of Title 13, which shall be known as the "City of Banning Stormwater Management and Discharge Control Code" or, "Stormwater Code" for short; and

WHEREAS, the City seeks through this Ordinance to amend the Stormwater Code to ensure the future health, safety, and general welfare of the citizens, as well as compliance with existing and future National Pollutant Discharge Elimination System ("NPDES") Permits; and

WHEREAS, NPDES Permit Number CAS617002 (R7-2008-0001) is the existing NPDES Permit applicable to the City, a copy of which is attached hereto as Exhibit "A".

NOW, THEREFORE, THE CITY COUNCIL OF THE CITY OF BANNING DOES ORDAIN AS FOLLOWS:

Section 1. Section 13.24.010 (Title) of the Stormwater Code is hereby amended to read in its entirety as follows:

> "The ordinance codified in this chapter shall be known as the 'City of Banning Stormwater Management and Discharge Control Code', or the 'Stormwater Code' for short, and may be so cited."

Section 2. Section 13.24.030 (Definitions) of the Stormwater Code is hereby amended to read in its entirety as follows:

"The terms as used in this Chapter shall have the following meanings:

A. Best Management Practice (BMP). BMP or BMPs mean schedules of activities, prohibitions of practices, general good housekeeping practices, maintenance procedures, educational programs, and other management practices to prevent or reduce the discharge of pollutants directly or indirectly to waters of the United States. BMPs shall include treatment requirements, operating procedures, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, and drainage from raw materials storage. The California Stormwater Best Management Practice Handbooks for Municipal, Industrial/Commercial and Construction Activity provide a detailed discussion of BMPs.

B. Detention Basin refers to a basin type structure which permits large flows of stormwater to enter and remain, but limits and controls the outflow (i.e. discharge) by having a small opening at the lowest point of the structure.

C. Director means the Director of the Public Works Department of the City of Banning.

D. Enforcement Officer includes the City Manager, Public Works Director, City Engineer, Building and Safety Official, Code Enforcement Officer, and their designees.

E. Illicit Connection means any physical connection to a Storm Drain System which has not been permitted by the City of Banning, the Riverside County Flood Control and Water Conservation District, or other appropriate public agency.

F. Illegal Discharge means any discharge to the Storm Drain System that is not composed entirely of Stormwater Runoff except discharges made pursuant to a National Pollutant Discharge Elimination System (NPDES) permit or as otherwise authorized by the Santa Ana or Colorado River Basin Regional Water Quality Control Board.

G. Infiltration Basin refers to designs and/or practices for directing stormwater from a basin type of structure to the groundwater table through permeable soils.

H. Municipal NPDES Permit means an area-wide NPDES permit issued to a government agency or agencies for the discharge of stormwater from a stormwater system, and shall refer to NPDES Permit Number CAS617002 (R7-2008-0001) or its successor.

I. National Pollutant Discharge Elimination System (NPDES) Permit means a stormwater discharge permit issued by the Santa Ana or Colorado River Basin Regional Water Quality Control Board in compliance with the federal Clean Water Act.

J. Non-Stormwater Discharge means any discharge to the Storm Drain System that is not entirely composed of stormwater.

K. Person means any natural person, firm, association, club, organization, corporation, partnership, business trust, company or other entity which is recognized by law as the subject of rights or duties.

L. Pollutant means anything which causes the deterioration of water quality such that it impairs subsequent and/or competing uses of the water. Pollutants may include but are not limited to paints, oil and other automotive fluids, soil, rubbish, trash, garbage, debris, refuse, waste, fecal coliform, fecal streptococcus, enterococcus, heavy metals, hazardous waste, chemicals, fresh concrete, yard waste from commercial landscaping operations, animal waste, materials that result from the process of constructing a building or structure, nauseous or offensive matter of any kind.

M. Premises means any building, lot, parcel of land, or portion of land whether improved or unimproved.

N. Retention Basin allows for relatively large flows of stormwater to enter in a basin type of structure during large storm events for which discharges are limited by outlet structures to a storm drain, the street, or other parts of the Storm Drain System. This type of basin notably has an outlet or discharge point so that stormwater does not accumulate in the basin for extended periods of time, when feasible, such that the stormwater permeates to a groundwater table.

O. Storm Drain System means any facility by which stormwater may be conveyed to waters of the United States. The Storm Drain System includes, but is not limited to, any roads with drainage systems, streets, curbs, gutters, catch basins, natural and artificial channels, ditches, aqueducts, storm drains, inlets, conduit or other drainage structures.

P. Stormwater Runoff means surface runoff and drainage associated with rainstorm events and snow melt."

Section 3. Section 13.24.070 (Discharge In Violation of Permit), subsection C., of the Stormwater Code is hereby amended to read in its entirety as follows:

"C. A copy of the current Municipal NPDES Permit will be filed in the City Clerk's Office."

Section 4. Section 13.24.080 (Illicit Connections) of the Stormwater Code is hereby amended to be entitled "Illicit Connections and Illegal Discharges" and to read in its entirety as follows:

"A. It is a violation of this Chapter to establish, use, maintain, or continue an Illicit Connection to the City's Storm Drain System, or to commence or continue any Illegal Discharge to the City's Storm Drain System. The prohibition against Illicit Connections is expressly retroactive and applies to past illicit connections when made.

B. Illegal Discharges include, without limitation, the following:

1. Discharges of wash water resulting from the hosing or cleaning of gas stations, auto repair garages, or other types of automotive services facilities;
2. Discharges resulting from the cleaning, repair, or maintenance of any type of equipment or machinery including motor vehicles, cement-related equipment, and port-a-potty service;

3. Discharges of wash water from mobile operations such as oily or greasy discharges from mobile automobile washing or similar mobile services, and/or discharges from steam cleaning, power washing, and carpet cleaning;
4. Discharges of runoff from material storage areas containing chemicals, fuels, grease, oil, or other Hazardous Materials as that term is defined by the federal Department of Transportation; and
5. Discharges of food-related wastes, including without limitation, grease, fish processing, and restaurant kitchen mat and trash bin wash water."

Section 5. Section 13.24.100 (Outdoor storage areas – Commercial and Industrial Facilities) of the Stormwater Code is hereby amended to read in its entirety as follows:

"A. It is a violation of this chapter for any person to improperly store grease, oil or other hazardous substances in outdoor areas such that any of these substances may leak or otherwise discharge from the container in which the substance is stored. In outdoor areas, no person shall improperly store motor vehicles, machine parts, or other objects in a manner that may leak grease, oil, or other hazardous substances.

B. To prevent the discharge of hazardous substances from the property, the City shall require the installation of a spill containment system. Spill containment systems may consist of a system of dikes, walls, barriers, berms, or other devices as required.

C. It is a violation of this Chapter for any person to operate a spill containment system such that it allows incompatible liquids to mix and thereby create a hazardous condition.

D. Any person or entity that owns or operates a commercial and/or industrial facility(s) shall comply with the provisions of this Chapter. All such facilities shall be subject to inspection as required by this Chapter, California Water Code §§ 13000 *et seq.* (Porter-Cologne Water Quality Control Act), Title 33 U.S.C. §§ 1251 *et seq.* (Clean Water Act), any applicable State or federal regulations promulgated thereto, and any related administrative orders or permits issued in connection therewith."

Section 6. Section 13.24.110 (Construction Sites) of the Stormwater Code is hereby amended to be entitled "Construction Sites and Onsite Storage and Infiltration of Stormwater" and to read in its entirety as follows:

"Any person performing construction work in the City shall comply with the provisions of this Chapter and the Uniform Building Code, latest edition, for erosion and sediment control, as well as City of Banning Ordinance 1388 which is incorporated by reference hereto. In addition, except as waived by or agreed to by the Director or the Director's designee consistent with NPDES permit provisions and requirements, development of all land within the City must include provisions for the management of Stormwater Runoff from the property which is to be developed, including volumetric or flow based treatment control BMP design criteria, and/or exceptions to these requirements, and methodologies used to ensure proper management of Stormwater Runoff post-construction. This management shall consist of constructing storage and/or infiltration facilities, which includes basins. At a minimum, all development will make provisions to store runoff from rainfall events up to and including the one-hundred-year, three-hour duration event. Post-development peak urban runoff discharge rates shall not exceed pre-development peak urban runoff discharge rates.

The City Engineer shall be provided for review, comment and/or approval the drainage study, hydrologic analysis and design of drainage facilities prepared by a licensed professional engineer."

Section 7. Section 13.24.120 (New Development and Redevelopment) of the Stormwater Code is hereby amended to read in its entirety as follows:

"A. Existing development shall control Stormwater Runoff so as to prevent any deterioration of water quality that would impair subsequent or competing uses of the water. The Director shall identify the BMPs that may be implemented to prevent such deterioration and shall indentify the manner of implementation.

B. Any new development or redevelopment project shall control the volume and rate of Stormwater Runoff from the project so as to prevent any deterioration of water quality which would impair the subsequent or competing uses of the water. The Director shall establish written retention standards and guidelines and/or implement BMPs designed to control the rate and volume of Stormwater Runoff from new developments and redevelopments as may be appropriate to minimize the discharge and transport of pollutants. The standards, guidelines and BMPs shall include a provision permitting adjustments for specific projects where the Director finds that due to unique circumstances not generally applicable to other properties, such adjustments are required but in such circumstances the Director shall provide a written finding.

1. All new development and redevelopment projects that fall into one of the following categories are subject to the Water Quality Management Plan Design Standards for Best Management Practices as set forth in the NPDES Permit Number CAS617002 (Section F.1.c.), which is incorporated by reference hereto, a copy of which is available in the City Clerk's Office:

a. Singly-family hillside residences that create 10,000 square feet, or more, of impervious area where the natural slope is twenty-five percent (25%) or greater, including single-family hillside residences that create 10,000 square feet of impervious area where the natural slope is ten percent (10%) or greater where erosive soil conditions are known;

b. 100,000 square foot commercial and industrial developments;

c. Automotive repair shops (with Standard Industrial Classification ("SIC") codes 5013, 7532, 7533, 7534, 7537, 7438, and 7539);

d. Retail gasoline outlets disturbing greater than 5,000 square feet;

e. Restaurants disturbing greater than 5,000 square feet;

f. Home subdivisions with 10 or more housing units; and

g. Parking lots 5,000 square feet or more or with 25 or more parking spaces and potentially exposed to non-stormwater discharges.

C. Acceptable methods and standards for controlling Stormwater Runoff volumes, rates, and pollutant load may include but are not limited to the following:

1. Increase Permeable Areas. Avoid placing impervious surfaces in highly porous soil areas; incorporate landscaping and open space into the project design; use porous materials for or near driveways and walkways; incorporate detention ponds and infiltration pits into the project's design; avoid placing pavement and other impervious surfaces in low lying areas.

2. Direct Runoff to Permeable Areas. Direct Stormwater Runoff away from impermeable areas to swales, berms, green strip filters, gravel beds, and french drains. Install rain gutters and orient them toward permeable areas. Modify the grade of the property to divert flow to permeable areas and minimize the amount of Stormwater Runoff leaving the property. When designing curbs, berms or other structures, avoid designs which isolate permeable or landscaped areas.

3. Maximize Stormwater Storage for Reuse. Use retention structures, subsurface areas, cisterns, or other structures to store Stormwater Runoff for reuse or slow release.

4. Any new development shall comply with the provisions of this Chapter, City of Banning Ordinance 1388 and the Municipal NPDES Permit, all of which are incorporated by reference hereto.

D. In the event the Municipal NPDES Permit is modified, the Director is authorized to apply the criteria of such successor permit.

E. In addition to the foregoing provisions, all existing and new development and redevelopment plans shall comply with Stormwater Code Section 13.24.110.

F. Any violation of this Section is punishable as provided in the Banning Municipal Code including this Chapter. In addition, fines may be imposed on a schedule agreed to between the City and any person or entity seeking to engage in a development or redevelopment project in the City."

Section 8. Section 13.24.125, "Issuance, Suspension and Revocation of Permits or Licenses," of the Stormwater Code is hereby added to read in its entirety as follows:

"A. No permit or license shall be issued unless it is in accordance with all the provisions of City ordinances as codified in the Banning Municipal Code, including Titles 5, 13 and 15, and any permit or license issued contrary to the provisions of the Banning Municipal Code shall be void and of no effect.

B. An Enforcement Officer, after compliance with the procedures hereunder, may revoke or suspend a permit or license issued by the City upon a finding that:

1. The permittee or licensee has violated any of the conditions or requirements of the permit or license, or provisions of the Banning Municipal Code and any ordinances, rules or regulations pertaining to the permit or license; or
2. The permit or license was issued in error; or
3. The permit or license was issued on the basis of incorrect information supplied by the permittee or licensee.

C. Revocation or suspension of a permit or license issued by the City is proper when written notice of the violation(s) has been sent to the permittee or licensee by first class mail and the permittee or licensee has failed or neglected to correct the violation within twenty (20) days from the date the written notice was mailed."

Section 9. Section 13.24.130 (Compliance with General Permits), subsection B., of the Stormwater Code is hereby amended to read in its entirety as follows:

"B. Proof of compliance with the Municipal NPDES Permit will be required in a form acceptable to the Director prior to issuance of any city grading, building, or occupancy permits. Due to requirements set forth in the NPDES Permit changing from time to time, said compliance with the Municipal NPDES Permit requires compliance with the most recent NPDES Permit on file in the City Clerk's Office."

Section 10. Section 13.24.150 (Authority to Inspect) of the Stormwater Code is hereby amended to read in its entirety as follows:

"A. Whenever necessary to make an inspection to enforce any of the provisions of this chapter or the Municipal NPDES Permit, or whenever an Enforcement Officer has reasonable cause to believe that there exists in any building or upon any premises any condition which constitutes a violation of the provisions of this Chapter, the Enforcement Officer may enter such building or premises at all reasonable times to inspect the same or perform any duty imposed upon the Enforcement Officer by this chapter.

B. Entry hereunder shall be subject to the following:

1. If such building or premises be occupied, an Enforcement Officer shall first present proper credentials and request entry; and
2. If such building or premises be unoccupied, an Enforcement Officer shall first make a reasonable effort to locate the owner or other persons having charge or control of the building or obtain a warrant to enter.

C. Any request for entry made hereunder shall state that the property owner or occupant has the right to refuse entry and that in the event such entry is refused, inspection may be made only upon issuance of a search warrant by a duly authorized magistrate. In the event the owner and/or occupant refuses entry after such request has been made, the official is empowered to seek assistance from any court of competent jurisdiction in obtaining such entry.

D. Routine or area inspections shall be based upon such reasonable selection processes as may be deemed necessary to carry out the objectives of this Chapter and the Municipal NPDES Permit, including but not limited to random sampling and/or sampling in areas with evidence of stormwater contamination, Illicit Connections, Illegal Discharges, Non-Stormwater Discharge to the Stormwater System, follow up inspections as required by the County of Riverside, the Compliance Assistance Program ("CAP") of the NPDES Permit, or the California State Water Quality Regional Control Board, or similar factors.

E. The property owner and/or occupant are liable for Inspection Fees as set forth in the City's adopted Fee Schedule through City Resolution 2006-114 duly adopted on September 12, 2006, which may be amended by the City Council from time to time."

Section 11. Section 13.24.180 (Requirement to Test or Monitor) of the Stormwater Code is hereby amended to read in its entirety as follows:

"A. An Enforcement officer may request that any person engaged in any activity and/or owning or operating any facility which may cause or contribute to Stormwater Runoff, Illicit Connections, Illegal Discharges, and/or discharge of Pollutants or Non-stormwater to the Stormwater System, undertake such monitoring activities and/or analyses and furnish such reports as the Enforcement Officer may specify. The burden, including costs, of these activities, analyses and reports shall bear a reasonable relationship to the need for the monitoring, analyses and reports and the benefits to be obtained. The recipient of such request shall undertake and provide the monitoring, analyses and/or reports requested within a reasonable time frame as set forth by the Enforcement Officer or as agreed to between the Enforcement Officer and the person.

B. In the event the owner or operator of a facility subject to a monitoring and/or analyses order fails to conduct required monitoring and/or analyses and furnish the required reports in the form required, an Enforcement Officer may cause such monitoring and/or analyses to be performed within thirty (30) days.

1. The costs, therefore, including the reasonable additional administrative costs incurred by the City, shall be the responsibility of the owner of the property and/or the person or entity in possession of the property.
2. The costs thereof shall be invoiced to the owner of the property and/or the person or entity in possession of the property.
3. If the invoice is not paid within sixty (60) days of the issuance thereof, the costs may be levied as a lien upon and against the property and continue in existence until the same shall be paid consistent with the Banning Municipal Code including Chapter 8.48.
4. If the lien is not satisfied by the owner of the property within three (3) months after the completion by an Enforcement Officer of the required monitoring and/or analyses and reports, the property may be sold in satisfaction thereof in a like manner as other real property is sold under execution."

__Section 12.__ Section 13.24.220 (Violations Deemed a Public Nuisance), subsection A., of the Stormwater Code is hereby amended to read in its entirety as follows:

"A. In addition to the penalties hereinbefore provided, any condition caused or permitted to exist in violation of any of the provisions of this Chapter is a threat to the public health, safety and welfare, and may be declared and deemed a nuisance, and may be summarily abated and/or restored by an Enforcement Officer, and/or civil action to abate, enjoin or otherwise compel the cessation of such nuisance may be taken as authorized by the Banning Municipal Code including Chapter 8.48 or in any other manner provided by law."

Section 13. Section 13.24.225, "Payment of Abatement Costs, Penalties or Damages," of the Stormwater Code is hereby added to read in its entirety as follows:

"If payment of an award of abatement costs, penalties or damages is not made within ten (10) days of an administrative or judicial determination of such costs, penalties or damages, the Enforcement Officer may file a Notice of Lien as provided for in the Banning Municipal Code, Chapter 8.48, describing the real property affected and the amount of the costs, penalties or damages claimed by the City with the Office of the County Recorder of Riverside County. The Enforcement Officer may transmit the judgment or award of abatement costs, penalties or damages of the City, which shall place the amount thereof on the Assessment Roll as a special assessment to be paid with County taxes, unless paid earlier. A judgment or award of such costs, penalties or damages may also be enforced in any other manner provided by law, including the property being sold under execution if the recorded lien remains unpaid for at least three (3) months."

Section 14. Section 13.24.240 (Civil Actions), subsection B., of the Stormwater Code is hereby amended to read in its entirety as follows:

"B. Assessment of the violator for the costs of any investigation, inspection, or monitoring survey which led to the establishment of the violation, and for the reasonable costs and attorney's fees of preparing and bringing legal action under this subsection."

Section 15. Section 13.24.270 (Nonexclusivity of Remedies) of the Stormwater Code is hereby amended to read in its entirety as follows:

"Remedies under this Chapter are in addition to and do not supersede or limit any and all other remedies, civil or criminal, as provided by federal, State and local law. The remedies provided for herein shall be cumulative and not exclusive."

Section 16. Section 13.24.280 (Appeal) of the Stormwater Code is hereby amended to read in its entirety as follows:

"In addition to the provisions of Chapter 1.20 of the Banning Municipal Code, any person, firm, corporation or organization required by an Enforcement Officer to perform monitoring, analyses, reporting, or corrective activities, or for revocation or suspension of a permit or license, and who is aggrieved by the decision of an Enforcement Officer, may appeal such decision to the Director within fifteen (15) days following the effective date of the Enforcement Officer's decision by writing to the Director. Upon receipt of such request, the Director shall request a report and recommendation from the Enforcement Officer and shall set the matter for hearing at the earliest practical date not to exceed sixty (60) days from the date the request is filed. At said hearing, the Director may hear additional evidence, and may reject, affirm or modify the Enforcement Officer's decision. Such decision shall be written and final unless appealed to the

City Council, which is required pursuant to California Code of Civil Procedure § 1094.6 prior to commencing any civil action commencing."

Section 17. If any part of this Ordinance are held to be invalid or unconstitutional by decision of any court of competent jurisdiction, such decision shall not affect the validity of the remaining portions of this Ordinance, and the City hereby declares that it would have passed the remainder of this Ordinance if such invalid portion thereof had been declared invalid or unconstitutional.

Section 18. The City Clerk shall certify to the adoption of this Ordinance and shall cause a copy of the same to be published in a manner prescribed by law. This Ordinance shall take effect and be in force thirty (30) days after the adoption by the City Council for the City of Banning.

PASSED, APPROVED and ADOPTED this 12th day of January, 2010.

Robert E. Botts, Mayor

ATTEST:

Marie A. Calderon, City Clerk

APPROVED AS TO FORM AND LEGAL CONTENT:

David J. Aleshire, City Attorney
Aleshire & Wynder, LLP

CERTIFICATION:

I, Marie A. Calderon, City Clerk of the City of Banning, do hereby certify that the foregoing Ordinance No. 1415 was duly introduced at a regular meeting of the City Council of the City of Banning, California, held on the 8th day of December, 2009 and was duly adopted at a regular meeting of said City Council held on the 12th day of January 2010 by the following vote, to wit:

AYES: Councilmembers Franklin, Hanna, Machisic, Robinson, Mayor Botts

NOES: None

ABSENT: None

ABSTAIN: None

Marie A. Calderon

Marie A. Calderon, City Clerk
City of Banning, California

EXHIBIT "A"

NPDES Permit Number CAS617002 (R7-2008-0001)

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD

COLORADO RIVER BASIN REGION

73-720 Fred Waring Drive, Suite 100, Palm Desert, CA 92260
Phone: (760) 346-7491 • Fax (760) 341-6820
http://www.waterboards.ca.gov/coloradoriver

ORDER NO. R7-2008-0001
NPDES NO. CAS617002

WASTE DISCHARGE REQUIREMENTS
FOR
DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEM (*MS4*)
WITHIN THE WHITEWATER RIVER WATERSHED
RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT, OWNER/OPERATOR
COUNTY OF RIVERSIDE, OWNER/OPERATOR
COACHELLA VALLEY WATER DISTRICT, OWNER/OPERATOR
AND INCORPORATED CITIES OF RIVERSIDE COUNTY WITHIN THE WHITEWATER RIVER BASIN, OWNERS/OPERATORS

Table 1. Administrative Information

This Order was adopted by the Regional Water Quality Control Board on:	**May 21, 2008**
This Order shall become effective on:	**May 21, 2008**
This Order shall expire on:	**May 21, 2013**
The Discharger shall file a Report of Waste Discharge in accordance with title 23, California Code of Regulations, not later than 180 days in advance of the Order expiration date as application for issuance of new ***Waste Discharge Requirements***. The date for submitting a complete application for reissuance is **November 23, 2012.**	

IT IS HEREBY ORDERED that this Order shall supercede Order No. 01-077 except for enforcement purposes, and, in order to meet the provisions contained in division 7 of the California Water Code (***CWC***) (commencing with section 13000) and regulations adopted hereunder, and the provisions of the federal Clean Water Act (***CWA***) (33 U.S.C. § 1251 et seq.) and regulations and guidelines adopted hereunder, the discharger shall comply with the requirements in this Order.

I, Robert Perdue, ***Executive Officer***, do hereby certify that this Order, with all attachments, is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, Colorado River Basin Region, on May 21, 2008.

Robert E Perdue

ROBERT PERDUE, Executive Officer

Attachment 2

(copy of AB 1881)

Assembly Bill No. 1881

CHAPTER 559

An act to add Section 1353.8 to the Civil Code, to repeal and add Article 10.8 (commencing with Section 65591) of Chapter 3 of Division 1 of Title 7 of the Government Code, to add Section 25401.9 to the Public Resources Code, and to add Article 4.5 (commencing with Section 535) to Chapter 8 of Division 1 of the Water Code, relating to water conservation.

[Approved by Governor September 28, 2006. Filed with Secretary of State September 28, 2006.]

LEGISLATIVE COUNSEL'S DIGEST

AB 1881, Laird. Water conservation.

(1) Existing law, the Davis-Sterling Common Interest Development Act, defines and regulates common interest developments, which include community apartment projects, condominium projects, planned developments, and stock cooperatives.

This bill would provide that the architectural guidelines of a common interest development shall not prohibit or include conditions that have the effect of prohibiting the use of low water-using plants as a group.

(2) The Water Conservation in Landscaping Act requires the Department of Water Resources to appoint an advisory task force to work with the department to draft a model local water efficient landscape ordinance that local agencies may adopt, requires the task force to submit the ordinance to the department on or before May 1, 1991, and requires the task force to cease to exist on the date the department adopts the model ordinance or January 1, 1992, whichever occurs first. The act requires the department, not later than January 1, 1992, to adopt a model local water efficient landscape ordinance which each local agency may adopt. The act makes the model local water efficient landscape ordinance adopted by the department applicable within the jurisdiction of a local agency if that local agency, by January 1, 1993, has not adopted a water efficient landscape ordinance or has not adopted certain findings that the adoption of the ordinance is unnecessary.

This bill would specify that the provision making the model ordinance applicable to a local agency on and after January 1, 1993, does not apply to chartered cities. The bill would require the department, to the extent funds are appropriated, not later than January 1, 2009, by regulation, to update the model ordinance in accordance with specified requirements. The bill would require the department to prepare and submit to the Legislature a prescribed report before the adoption of the updated model ordinance. The bill would require a local agency, not later than January 1, 2010, to adopt the updated model ordinance or other water efficient

landscape ordinance that is at least as effective in conserving water as the updated model ordinance. The bill would make the updated model ordinance applicable within the jurisdiction of a local agency, including a chartered city, if, by January 1, 2010, the local agency has not adopted its own water efficient landscape ordinance or the updated model ordinance. The bill would require each local agency, not later than January 31, 2010, to notify the department as to whether the local agency is subject to the department's updated model ordinance and, if not, to submit to the department a copy of the water efficient landscape ordinance adopted by the local agency, among other documents. The bill would require the department, to the extent funds are appropriated, not later than January 31, 2011, to prepare and submit a report to the Legislature relating to the status of water efficient landscape ordinances adopted by local agencies.

By imposing requirements on local agencies in connection with the adoption of water efficient landscape ordinances, the bill would impose a state-mandated local program.

(3) Existing law requires the State Energy Resources Conservation and Development Commission (Energy Commission), after one or more public hearings, to take specified action to reduce the wasteful, uneconomic, inefficient, or unnecessary consumption of energy. Existing law requires the Energy Commission, by January 1, 2004, to amend specified regulations to require that residential clothes washers manufactured on or after January 1, 2007, be at least as water efficient as commercial clothes washers, and to take certain other related action.

This bill would require the Energy Commission, in consultation with the department, to adopt, to the extent funds are available, by regulation performance standards and labeling requirements for landscape irrigation equipment, including irrigation controllers, moisture sensors, emission devices, and valves to reduce the wasteful, uneconomic, inefficient, or unnecessary consumption of energy or water. The bill would require the Energy Commission to adopt those requirements for landscape irrigation controllers and moisture sensors by January 1, 2010, and, on and after January 1, 2012, would prohibit the sale or installation of an irrigation controller or moisture sensor for landscape use unless the controller or sensor meets those adopted requirements. The bill would require the Energy Commission, on or before January 1, 2010, to prepare and submit to the Legislature a report that sets forth a proposed schedule for adopting performance standards and labeling requirements for emission devices and valves.

(4) Existing law generally requires an urban water supplier to install water meters on all municipal and industrial service connections located within its service area on or before January 1, 2025.

This bill would require a water purveyor as defined, to require as a condition of new retail water service on and after January 1, 2008, the installation of separate water meters to measure the volume of water used exclusively for landscape purposes. The bill would make this requirement applicable to specified service connections.

(5) The California Constitution requires the state to reimburse local agencies and school districts for certain costs mandated by the state. Statutory provisions establish procedures for making that reimbursement.

This bill would provide that, if the Commission on State Mandates determines that the bill contains costs mandated by the state, reimbursement for those costs shall be made pursuant to these statutory provisions.

The people of the State of California do enact as follows:

SECTION 1. Section 1353.8 is added to the Civil Code, to read:

1353.8. The architectural guidelines of a common interest development shall not prohibit or include conditions that have the effect of prohibiting the use of low water-using plants as a group.

SEC. 2. Article 10.8 (commencing with Section 65591) of Chapter 3 of Division 1 of Title 7 of the Government Code is repealed.

SEC. 3. Article 10.8 (commencing with Section 65591) is added to Chapter 3 of Division 1 of Title 7 of the Government Code, to read:

Article 10.8. Water Conservation in Landscaping

65591. This article shall be known and may be cited as the Water Conservation in Landscaping Act.

65592. Unless the context requires otherwise, the following definitions govern the construction of this article:

(a) "Department" means the Department of Water Resources.

(b) "Local agency" means any city, county, or city and county, including a charter city or charter county.

(c) "Water efficient landscape ordinance" means an ordinance or resolution adopted by a local agency, or prepared by the department, to address the efficient use of water in landscaping.

65593. The Legislature finds and declares all of the following:

(a) The waters of the state are of limited supply and are subject to ever increasing demands.

(b) The continuation of California's economic prosperity is dependent on adequate supplies of water being available for future uses.

(c) It is the policy of the state to promote the conservation and efficient use of water and to prevent the waste of this valuable resource.

(d) Landscapes are essential to the quality of life in California by providing areas for active and passive recreation and as an enhancement to the environment by cleaning air and water, preventing erosion, offering fire protection, and replacing ecosystems lost to development.

(e) Landscape design, installation, maintenance, and management can and should be water efficient.

(f) Section 2 of Article X of the California Constitution specifies that the right to use water is limited to the amount reasonably required for the

beneficial use to be served and the right does not and shall not extend to waste or unreasonable use or unreasonable method of use.

(g) (1) The Legislature, pursuant to Chapter 682 of the Statutes of 2004, requested the California Urban Water Conservation Council to convene a stakeholders work group to develop recommendations for improving the efficiency of water use in urban irrigated landscapes.

(2) The work group report includes a recommendation to update the model water efficient landscape ordinance adopted by the department pursuant to Chapter 1145 of the Statutes of 1990.

(3) It is the intent of the Legislature that the department promote the use of this updated model ordinance.

(h) Notwithstanding Article 13 (commencing with Section 65700), this article addresses a matter that is of statewide concern and is not a municipal affair as that term is used in Section 5 of Article XI of the California Constitution. Accordingly, it is the intent of the Legislature that this article, except as provided in Section 65594, apply to all cities and counties, including charter cities and charter counties.

65594. (a) Except as provided in Section 65595, if by January 1, 1993, a local agency did not adopt a water efficient landscape ordinance and did not adopt findings based on climatic, geological, or topographical conditions, or water availability that state that a water efficient landscape ordinance is unnecessary, the model water efficient landscape ordinance adopted by the department pursuant to Chapter 1145 of the Statutes of 1990 shall apply within the jurisdiction of the local agency as of that date, shall be enforced by the local agency, and shall have the same force and effect as if adopted by the local agency.

(b) Notwithstanding subdivision (b) of Section 65592, subdivision (a) does not apply to chartered cities.

(c) This section shall apply only until the department updates the model ordinance.

65595. (a) (1) To the extent funds are appropriated, not later than January 1, 2009, by regulation, the department shall update the model water efficient landscape ordinance adopted pursuant to Chapter 1145 of the Statutes of 1990, after holding one or more public hearings. The updated model ordinance shall be based on the recommendations set forth in the report prepared pursuant to Chapter 682 of the Statutes of 2004 and shall meet the requirements of Section 65596.

(2) Before the adoption of the updated model ordinance pursuant to paragraph (1), the department shall prepare and submit to the Legislature a report relating to both of the following:

(A) The extent to which local agencies have complied with the model water efficient landscape ordinance adopted pursuant to Chapter 1145 of the Statutes of 1990.

(B) The department's recommendations regarding the landscape water budget component of the updated model ordinance described in subdivision (b) of Section 65596.

(b) Not later than January 31, 2009, the department shall distribute the updated model ordinance adopted pursuant to subdivision (a) to all local agencies and other interested parties.

(c) On or before January 1, 2010, a local agency shall adopt one of the following:

(1) A water efficient landscape ordinance that is, based on evidence in the record, at least as effective in conserving water as the updated model ordinance adopted by the department pursuant to subdivision (a).

(2) The updated model ordinance described in paragraph (1).

(d) If the local agency has not adopted, on or before January 1, 2010, a water efficient landscape ordinance pursuant to subdivision (c), the updated model ordinance adopted by the department pursuant to subdivision (a) shall apply within the jurisdiction of the local agency as of that date, shall be enforced by the local agency, and shall have the same force and effect as if adopted by the local agency.

(e) Nothing in this article shall be construed to require the local agency's water efficient landscape ordinance to duplicate, or to conflict with, a water efficiency program or measure implemented by a public water system, as defined in Section 116275 of the Health and Safety Code, within the jurisdictional boundaries of the local agency.

65596. The updated model ordinance adopted pursuant to Section 65595 shall do all the following in order to reduce water use:

(a) Include provisions for water conservation and the appropriate use and groupings of plants that are well-adapted to particular sites and to particular climatic, soil, or topographic conditions. The model ordinance shall not prohibit or require specific plant species, but it may include conditions for the use of plant species or encourage water conserving plants. However, the model ordinance shall not include conditions that have the effect of prohibiting or requiring specific plant species.

(b) Include a landscape water budget component that establishes the maximum amount of water to be applied through the irrigation system, based on climate, landscape size, irrigation efficiency, and plant needs.

(c) Promote the benefits of consistent local ordinances in neighboring areas.

(d) Encourage the capture and retention of stormwater onsite to improve water use efficiency or water quality.

(e) Include provisions for the use of automatic irrigation systems and irrigation schedules based on climatic conditions, specific terrains and soil types, and other environmental conditions. The model ordinance shall include references to local, state, and federal laws and regulations regarding standards for water-conserving irrigation equipment. The model ordinance may include climate information for irrigation scheduling based on the California Irrigation Management Information System.

(f) Include provisions for onsite soil assessment and soil management plans that include grading and drainage to promote healthy plant growth and to prevent excessive erosion and runoff, and the use of mulches in shrub areas, garden beds, and landscaped areas where appropriate.

(g) Promote the use of recycled water consistent with Article 4 (commencing with Section 13520) of Chapter 7 of Division 7 of the Water Code.

(h) Seek to educate water users on the efficient use of water and the benefits of doing so.

(i) Address regional differences, including fire prevention needs.

(j) Exempt landscaping that is part of a registered historical site.

(k) Encourage the use of economic incentives to promote the efficient use of water.

(*l*) Include provisions for landscape maintenance practices that foster long-term landscape water conservation. Landscape maintenance practices may include, but are not limited to, performing routine irrigation system repair and adjustments, conducting water audits, and prescribing the amount of water applied per landscaped acre.

(m) Include provisions to minimize landscape irrigation overspray and runoff.

65597. Not later than January 31, 2010, each local agency shall notify the department as to whether the local agency is subject to the department's updated model ordinance adopted pursuant to Section 65595, and if not, shall submit to the department a copy of the water efficient landscape ordinance adopted by the local agency, and a copy of the local agency's findings and evidence in the record that its water efficient landscape ordinance is at least as effective in conserving water as the department's updated model ordinance. Not later than January 31, 2011, the department shall, to the extent funds are appropriated, prepare and submit a report to the Legislature summarizing the status of water efficient landscape ordinances adopted by local agencies.

65598. Any model ordinance adopted pursuant to this article shall exempt cemeteries from all provisions of the ordinance except those set forth in subdivisions (h), (k), and (*l*) of Section 65596. In adopting language specific to cemeteries, the department shall recognize the special landscape management needs of cemeteries.

65599. Any actions or proceedings to attach, review, set aside, void, or annul the act, decision, or findings of a local agency on the ground of noncompliance with this article shall be brought pursuant to Section 1085 of the Code of Civil Procedure.

SEC. 4. Section 25401.9 is added to the Public Resources Code, to read:

25401.9. (a) To the extent that funds are available, the commission, in consultation with the Department of Water Resources, shall adopt by regulation, after holding one or more public hearings, performance standards and labeling requirements for landscape irrigation equipment, including, but not limited to, irrigation controllers, moisture sensors, emission devices, and valves, for the purpose of reducing the wasteful, uneconomic, inefficient, or unnecessary consumption of energy or water.

(b) For the purposes of complying with subdivision (a), the commission shall do all of the following:

(1) Adopt performance standards and labeling requirements for landscape irrigation controllers and moisture sensors on or before January 1, 2010.

(2) Consider the Irrigation Association's Smart Water Application Technology Program testing protocols when adopting performance standards for landscape irrigation equipment, including, but not limited to, irrigation controllers, moisture sensors, emission devices, and valves.

(3) Prepare and submit a report to the Legislature, on or before January 1, 2010, that sets forth on a proposed schedule for adopting performance standards and labeling requirements for emission devices and valves.

(c) On and after January 1, 2012, an irrigation controller or moisture sensor for landscape irrigation uses may not be sold or installed in the state unless the controller or sensor meets the performance standards and labeling requirements established pursuant to this section.

SEC. 5. Article 4.5 (commencing with Section 535) is added to Chapter 8 of Division 1 of the Water Code, to read:

Article 4.5. Irrigated Landscape

535. (a) A water purveyor shall require as a condition of new retail water service on and after January 1, 2008, the installation of separate water meters to measure the volume of water used exclusively for landscape purposes.

(b) Subdivision (a) does not apply to either of the following:

(1) Single-family residential connections.

(2) Connections used to supply water for the commercial production of agricultural crops or livestock.

(c) Subdivision (a) applies only to a service connection for which both of the following apply:

(1) The connection serves property with more than 5,000 square feet of irrigated landscape.

(2) The connection is supplied by a water purveyor that serves 15 or more service connections.

(d) For the purposes of this section, "new retail water service" means the installation of a new water meter where water service has not been previously provided, and does not include applications for new water service submitted before January 1, 2007.

SEC. 6. If the Commission on State Mandates determines that this act contains costs mandated by the state, reimbursement to local agencies and school districts for those costs shall be made pursuant to Part 7 (commencing with Section 17500) of Division 4 of Title 2 of the Government Code.

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Attachment 3

(copy of DWR letter dated October 8, 2009)

STATE OF CALIFORNIA – CALIFORNIA NATURAL RESOURCES AGENCY
ARNOLD SCHWARZENEGGER, Governor

DEPARTMENT OF WATER RESOURCES
1416 NINTH STREET, P.O. BOX 942836
SACRAMENTO, CA 94236-0001
(916) 653-5791

OCT 08 2009

Cities and Counties:

Adoption of the Updated Model Water Efficient Landscape Ordinance

Your action is required to conserve water supplies and comply with State law. The Water Conservation in Landscaping Act of 2006 (Assembly Bill 1881, Laird) requires cities and counties, including charter cities and charter counties, to adopt landscape water conservation ordinances by January 1, 2010. In accordance with this law, the Department of Water Resources (DWR) has prepared an updated Model Water Efficient Landscape Ordinance (MWELO) for your use, please see Enclosure 1. Text of the updated MWELO is also posted on DWR's Water Use and Efficiency Branch website at http://www.water.ca.gov/wateruseefficiency/landscapeordinance/. All local agencies (cities, counties, cities and counties, charter cities and charter counties) have until January 1, 2010, to adopt DWR's updated MWELO or their own local water efficient landscape ordinance. If a local agency has not adopted its own ordinance on or before January 1, 2010, the updated MWELO shall apply within the jurisdiction of that local agency as of that date.

DWR is working with local agencies and governments to conduct outreach activities including workshops to assist implementation of water efficient landscape ordinances. For October and November workshops, please see Enclosure 2. For questions on the updated MWELO and information on DWR's outreach activities, please e-mail mweo@water.ca.gov or contact us at (877) 693-5610 (877-MWELO10), so that a member of our staff can provide personalized service.

Each local agency has until January 31, 2010, to either notify DWR that it has adopted DWR's updated MWELO; or submit to DWR a copy of its adopted water efficient landscape ordinance, a copy of its findings, and evidence that its water efficient landscape ordinance is at least as effective at conserving water as DWR's updated MWELO. Please submit all notifications and documents to:

Mr. Simon Eching
California Department of Water Resource
Water Use and Efficiency Branch
Post Office Box 942836
Sacramento, California 94236-0001

In California's warm, dry climate, more than half of urban water supplies may be used for landscape irrigation. Ensuring efficient landscapes in new developments and reducing water waste in existing landscapes are among the most cost-effective ways to stretch our limited water supplies and ensure that we continue to have the water we need. Other benefits include reduced irrigation runoff, reduced pollution of waterways, drought resistance, and less green waste.

Thank you for your help conserving California's water supplies.

Sincerely,

Lester A. Snow for
Director

Enclosures

cc: California Urban Water Suppliers

Sec. 31-3. Water rate schedule.

Water rates for the city are as follows:

Water Rate Schedule--June 2003.

CUSTOMER BASE CHARGE

Meter Size	August 7, 2003 $/Month	August 7, 2004 $/Month	August 7, 2005 $/Month	August 7, 2006 $/Month
5/8"	$13.20	$14.52	$15.97	$16.77
3/4"	$13.20	$14.52	$15.97	$16.77
1"	$20.18	$22.20	$24.42	$25.64
1 1/2"	$36.89	$40.58	$44.64	$46.87
2"	$57.07	$62.78	$69.06	$72.51
3"	$104.40	$114.84	$126.32	$132.64
4"	$171.91	$189.10	$208.01	$218.41
6"	$340.34	$374.37	$411.81	$432.40
8"	$542.18	$596.40	$656.04	$688.84

COMMODITY CHARGE

Rate Plans	August 7, 2003 $/HCF	August 7, 2004 $/HCF	August 7, 2005 $/HCF	August 7, 2006 $/HCF
0-9 HCF	$0.90	$0.99	$1.09	$1.15
10-29 HCF	$1.06	$1.16	$1.28	$1.34
30+ HCF	$1.19	$1.31	$1.44	$1.51

***Note: HCF is Hundred Cubic Feet**

(Ord. No. 962, § 1; Ord. No. 973, § 1; Ord. No. 1014, § 1; Ord. No. 1063, § 1; Ord. No. 1102, § 1; Ord. No. 1296, § 1.)

Sec. 31-4. Water system connection fee.

(a) All applicants for water service shall pay a water connection fee of four thousand three hundred ninety dollars for each equivalent dwelling unit. This amount is necessary to cover the reasonable costs of the water service to be rendered.

(b) The water system connection fee shall be required to be paid according to the schedule set forth below.

(G) Exceptions.

1. The city council may grant a reduction, waiver, or special credit applicable to the sewer system connection fee upon an express finding from the evidence presented that such action would be in the public interest. Application for a reduction, waiver or special credit shall be made in writing to the city manager and city staff shall review such application and make recommendations thereon to the city council.

2. In addition, the following rules apply to the following special cases:

(a) Any structure completed prior to February 27, 1962 shall be exempt from the sewer system connection fee.

(b) A parcel of land which was within the city and was subdivided prior to December 31, 1978, and is capable of directly connecting to a sewer which was constructed prior to December 31, 1978, shall be assessed a connection fee in amount up to sixty-five percent of the connection fee provided for in this section, and shall be entitled to one equivalent dwelling unit connection. (Ord. No. 1150, § 1; Ord. No. 966, § 1; Ord. No. 996, § 1; Ord. No. 1052, § 1; Ord. No. 1105, § 1; Ord. No. 1174, § 1; Ord. No. 1196, § 1; Ord. No. 1287, § 1; Ord. No. 1294 §§ 1—3.)

Sec. 31-5.1. Sewer rate schedule.

Sewer rates for the city are as follows:

Sewer Rate Schedule--June 2003.

August 7, 2003
Approved Charge

$12.86	Sewer Usage Charge per EDU
$ 2.00	Surcharge per EDU

***Note: EDU is Equivalent Dwelling Unit**

(Ord. No. 1297, § 1.)

Article II. Water Conservation.

Sec. 31-6. Urban water management/conservation plan.

The City of Banning adopts the urban water management/conservation plan, a copy of which is on file in the office of the city clerk. (Ord. No. 1231 § 1.)

Sec. 31-7. Restricting water use during water supply emergencies.

(a) Definitions. As used in this section:

(1) "Agency" means City of Banning.

(2) "Council" means city council of the city.

(3) "Emergency supply shortage" means any water shortage caused by an earthquake, loss of electrical power, pipe line breakage, or any other threatened or existing water shortage caused by a disaster or facility failure which results in city inability to meet the water demands of its customers.

(4) "Water operations superintendent" means the water services supervisor of the city.

(5) "Waste" means any unreasonable or nonbeneficial use of water, or any unreasonable method of use of water, as determined by the council, including, but not limited to, the specific uses prohibited and restricted by this section as hereinafter set forth.

(6) "Water users" means any person, firm, partnership, association, corporation or political entity using water obtained from the water system of the city.

(7) "Water" means water supplied by the city.

(b) Noticed public hearing prior to mandatory conservation. Except when an emergency is caused by the breakage or failure of a dam, pump, pipeline or conduit, a noticed public hearing shall be held prior to the adoption of stages 2, 3 or 4 of the water supply plan for emergency supply shortage as set forth in subsections (c)(2), (c)(3) and (c)(4) of this section. Notice of the time and place of hearing shall be published at least seven days prior to the date of hearing in a newspaper printed, published, and circulated within the area in which the water supply is distributed, or if there is no such newspaper, in any newspaper printed, published, and circulated in the county in which the area is located.

(c) Water supply plan for emergency supply shortage.

(1) Stage No. 1. Normal conditions: voluntary conservation measures. Normal conditions shall be in effect when the city is able to meet all the water demands of its customers in the immediate future. During normal conditions, all water users should continue to use water wisely, to prevent the waste or unreasonable use of water, and to reduce water consumption to that necessary for ordinary domestic and commercial purposes.

(2) Stage No. 2. Water shortage alert: mandatory conservation measures. In the event of a sudden and unexpected water supply shortage which could prevent the city from meeting the water demands of its customers, the council shall immediately hold a public hearing at which consumers of the water supply shall have the opportunity to protest and to present their respective needs to the council. No public hearing shall be required in the event of a breakage or failure of a dam, pump, pipeline or conduit causing an immediate emergency. The council may then declare a water shortage emergency condition to prevail, and the following rules and regulations shall be in effect immediately following such declaration.

(A) Washing driveways, parking lots, or other hard surfaced area, or building exteriors at any time, except to alleviate immediate fire hazards is prohibited;

(B) Parks, golf courses and school grounds are to be irrigated during nighttime hours only, between sunset and sunrise;

(C) Lawn watering and landscape irrigating, including construction meter use, is prohibited between the hours of 10:00 A.M. to 5:00 P.M.;

(D) Running water shall not be used for washing privately owned vehicles. A bucket may be used for the washing of vehicles and only hoses equipped with shut-off nozzles may be used for rinsing;

(E) Restaurants are requested not to provide drinking water to patrons except by request;

(F) Commercial nurseries shall use water only during the hours from midnight to 6:00 A.M. Irrigation of propagation beds and watering of livestock is permitted as necessary during any hours.

(G) Golf courses using reclaimed water are exempted from these restrictions.

(3) Stage No. 3. Water shortage warning. The council may, following a public hearing as set forth in subsection (b) of this section, declare that an emergency water supply shortage exists, and that the agency is unable to meet all the water demands of its customers. Immediately thereafter, the following water conservation measures shall apply:

(A) Parks and schools shall be watered on alternate days during the hours between sunset to sunrise, the schedule of which shall be set following the public hearing.

(B) Golf courses which utilize domestic water from the city's domestic system may irrigate greens only during the hours between sunset to sunrise. Golf courses utilizing reclaimed water are exempted from this restriction;

(C) Other lawn watering and landscape irrigating, including construction meter use, are restricted as follows: customers with even-numbered street addresses may water only on even-numbered days, customers with odd-numbered street addresses may water only on odd-numbered days, and no watering or irrigating shall be done between the hours of 10:00 A.M. and 5:00 P.M. on any day;

(D) Washing down of driveways, parking lots, or other paved surfaces is prohibited;

(E) Washing of vehicles is restricted to commercial car wash establishments which recycle their water;

(F) Filling or adding water to swimming pools, wading pools, spas, ornamental ponds, fountains and artificial lakes is prohibited;

(G) Restaurants shall not serve drinking water to patrons except by request;

(H) No new construction meter permits shall be issued by the agency;

(I) Construction metered water shall not be used for earth work or road construction purposes;

(J) Water of livestock is permitted as necessary during any hours;

(K) Commercial nurseries may use water only between the hours of midnight and 6:00 A.M. Irrigation of propagation beds is permitted as necessary during any hours. Commercial nurseries utilizing reclaimed water are exempted from this restriction.

(4) Stage No. 4. Mandatory compliance. Water shortage emergency. Following a declaration by the city council that an emergency water supply shortage due to a major failure in a supply of distribution facility exists, the following water conservation measures shall apply:

(A) Watering of parks, school grounds and golf courses is prohibited, except by reclaimed water;

(B) Watering of lawn and irrigating of landscape is prohibited;

(C) Washing down of driveways, parking lots, or other paved surfaces is prohibited;

(D) Washing of vehicles is prohibited, except when done by commercial car wash establishments using recycled or reclaimed water;

(E) Filling or adding water to swimming pools, wading pools, spas, ornamental ponds, fountains and artificial lakes is prohibited;

(F) No serving of drinking water by restaurants to patrons except by request;

(G) No issuing of new construction meter permits by the city;

(H) Turning off and locking all existing construction meters;

(I) Discontinuing all watering and irrigating of commercial nurseries. Those utilizing reclaimed water are exempted from this restriction. Watering of livestock is permitted as necessary.

(d) Council discretion to modify conservation measures upon a showing of necessity therefor. The specific requirements of each mandatory conservation stage shall be effective upon adoption by the council following a public hearing, except that the council may modify or amend such requirements at the time of adoption upon a showing of the need for such modification or amendment.

(e) Implementation and termination of mandatory compliance stages. The water operations superintendent of the city shall monitor the supply and demand for water on a daily basis to determine the level of conservation required by the implementation or termination of the water conservation stages, and shall notify the council of the necessity for the implementation or termination of each stage. Each declaration of the council implementing or terminating a water conservation stage shall be published at least once in a newspaper of general circulation, and shall remain in effect until the city council otherwise declares, as provided herein.

(f) Exceptions. Application for exception permit. The water operations superintendent of the city may grant permits for uses of water otherwise prohibited thereby if he/she finds and determines that special circumstances make compliance not reasonably possible, or that restrictions herein would either:

(1) Cause an unnecessary and undue hardship to the water user or the public; or

(2) Cause an emergency condition affecting the health, sanitation, fire protection or safety of the water user or of the public.

Such exceptions may be granted only upon application therefor. Upon granting any such exception permit, the water operations superintendent may impose any conditions he/she determines to be just and proper.

(g) Criminal proceedings for violation. The city council hereby declares that, pursuant to Water Code Section 377, it shall be a misdemeanor for any person to use or apply water contrary to or in violation of any mandatory restriction or requirement established by this section and, upon conviction thereof, that person, firm or corporation shall be punished by imprisonment in the county jail for not more than thirty days or a fine of not more than one thousand dollars or by both such fine and imprisonment.

(h) Civil proceedings for violation. In addition to criminal penalties, violators of the mandatory provisions of this section shall be subject to civil action initiated by the city.

(1) First violation. For a first violation, the city shall issue a written notice of violation to the water user violating the provisions of this chapter.

(2) Second violation: twenty-five percent surcharge. For a second violation of this section within a twelve-month period, a one-month surcharge is hereby imposed in an amount equal to twenty-five percent of the previous month's water bill for the meter through which the wasted water was supplied.

(3) Third violation: fifty percent surcharge; installation of flow restrictor. For a third violation of this section within a twelve-month period, a one-month penalty surcharge is hereby imposed in an amount equal to fifty percent of the previous month's water bill for the meter through which the wasted water was supplied. In addition to the surcharge, the agency may at its discretion install a flow-restricting device at such meter with a one-eighth-inch orifice for services up to one and one-half inch size, and comparatively sized restrictors for larger services, on the service of the customer at the premises at which the violation occurred, for a period of not less than forty-eight hours. The charge for installing a flow-restricting device shall be based upon the size of the meter and the cost of installation but shall not be less than twenty-five dollars. The charge for removal of the flow-restricting device and restoration of normal service shall be twenty-five dollars if restoration of normal service is performed during the hours of 7:00 A.M. to 3:30 P.M. on regular working days. If the removal of the flow-restricting device and restoration of normal service is made after regular working hours, on holidays or weekends, the restoration service charge shall be forty dollars.

(4) Subsequent violations; discontinuance of service. For any subsequent violation of this section within the twenty-four calendar months after a first violation as provided in subsection (h)(1) of this section, the penalty surcharge provided in subsection (h)(3) of this section shall be imposed and the city shall discontinue water service to that customer at the premises or to the meter where the violation occurred. The charge for reconnection and restoration of normal service shall be twenty-five dollars. Such restoration of service shall not be made until the water operations superintendent of the city has determined that the water user has provided reasonable assurances that future violations of this section by such user will not occur.

(i) Notice.

(1) For a first violation, written notice may be given to the customer personally or by certified mail.

(2) If the penalty assessed is a surcharge for a second or third violation, notice may be given by certified mail.

(3) If the penalty assessed is, or includes, the installation of a flow restrictor or the discontinuance of water service to the customer for any period of time whatever, notice of the violation shall be given in the following manner:

(A) By giving written notice thereof by certified mail or to the customer personally; or

(B) If he/she is absent from his/her place of residence and from his/her assumed place of business, by leaving a copy with some person of suitable age and discretion at either place, and sending a copy through the United States mail, certified, addressed to the customer at either his/her place of business or residence; or

(C) If such place of residence and business cannot be ascertained, or a person of suitable age or discretion cannot be found, then by affixing a copy in a conspicuous place on the property where the failure to comply is occurring and also by delivering a copy to a person residing, if such person can be found, and also sending a copy through the United States mail, certified, addressed to the customer at the place where the property is situated.

(4) Any notice provided hereunder shall contain, in addition to the facts of the violation, a statement of the possible penalties for each violation and a statement of the possible penalties for each violation and a statement informing the customer of his right to a hearing on the violation.

(j) Hearing. Any customer against whom a penalty is levied pursuant to subsections (g) and (h) of this section shall have a right to a hearing, in the first instance by the water operations superintendent, with the right of appeal to the city council, on the merits of the alleged violation upon the written request of that customer within fifteen days of the date of infraction of the violation.

(k) Reservation of rights. The rights of the city hereunder shall be cumulative to any other right of the city to discontinue service. All moneys collected by the department pursuant to any of the penalty provisions of this chapter shall be deposited in the operating fund as reimbursement for the city's costs and expenses of administering and enforcing this section.

(l) Concurrent authority. The city manager, its water operations superintendent and designated employees, have the duty and are hereby authorized to enforce all provisions of this section, with the qualification that the city through enforcement of this section, the county as to unincorporated territory within the city, are recognized to have concurrent authority for, and shall have the primary responsibility for the control of water flowing in the streets where such occurs within their respective jurisdictions. (Ord. No. 1040, § 1.)

Sec. 31-8. Water conservation using xeriscape principles.

(a) Intent. Water is an increasingly limited and costly resource. It is the intent of this section to establish a water conservation plan to reduce water consumption in the landscape environment using xeriscape principles.

(b) Definitions. "Low water-using drought tolerant plant" includes species suited to our climate, requiring less water in order to grow well.

"Xeriscape" shall mean a combination of landscape features and techniques that in the aggregate reduce the demand for and consumption of water, including appropriate low water using plants, non-living ground-cover, a low percentage of turf coverage, permeable paving and water conserving irrigation techniques and systems.

(c) Applicability. The provisions of this section shall apply to all developments within the city including, but not limited to, the following:

(1) All new residential developments (including townhomes and apartment projects) on parcels greater than seven thousand square feet;

(2) Rehabilitated landscaping (for projects on parcels greater than ten thousand square feet) for industrial, commercial, institutional, multifamily and residential common areas of PUDs (Planned Unit Developments);

(3) Interior remodels, tenant improvements and demolitions for any of the above projects;

(4) Schools, parks, golf courses or similar public open spaces;

(5) Water conservation landscape requirements shall apply to all new developments. New development applications shall include landscape plans which require final approval at the time of final project approval.

(d) Exceptions. The provisions of this section shall not apply to those projects which have been approved or accepted as complete for processing prior to the effective date of the ordinance codified in this section; provided no material amendments or extensions are made to such previously approved projects. These provisions shall also not apply to the following:

(1) Homeowner-provided landscaping at single-family and multifamily projects;

(2) Cemeteries;

(3) Registered historical sites;

(4) Ecological restoration projects that do not require a permanent irrigation system;

(5) Mined-land reclamation projects that do not require a permanent irrigation system.

(e) Requirements.

(1) Turf limitation. The maximum allowed turf and/or water area (expressed as percent of planted area) shall be twenty-five percent for industrial,

commercial, residential developments with common area, institutions and public/semi-public developments. If turf is an essential part of development, such as playing fields for schools or public parks, a higher percentage will be allowed, and will be evaluated on an individual basis. No turf shall be allowed in median strips or in areas less than eight feet wide.

If a residential development has one or more model homes, it is required that at least one model home in the development be planted with drought tolerant plants and a maximum of twenty-five percent turf and/or water area. Additionally, developers shall provide buyers with sample landscape plans using low water-using plants and a maximum twenty-five percent turf area. The developer shall also provide information about outdoor water conservation by distributing pamphlets to buyers regarding this subject. Such pamphlets are available from local water districts and the state department of water resources. The county community development department will have samples of appropriate types of pamphlets available. Landscape and distribution of literature shall require approval by the community development department.

(2) Types of plants in non-turf areas. At least ninety percent of the plants in non-turf areas shall be low water-requiring, drought-resistant plants as approved by the community development department. A small percentage of the planted area (up to ten percent) can be used for nondrought tolerant varieties if they are grouped together and can be irrigated separately.

(3) Use of mulch. A minimum of two inches of mulch shall be added to the soil surface after planting. Nonporous material shall not be placed under the mulch.

(4) Irrigation.

(A) Sprinklers and sprays shall not be used in areas less than eight feet wide. Drip and bubbler shall be used that do not exceed one and one-half gallons per minute per device.

(B) Sprinkler heads with a precipitation rate of .85" per hour or less shall be used in slopes exceeding fifteen percent to minimize runoff, or exceeding ten percent within ten feet of hardscape.

(C) Valves and circuits shall be separated based on water use.

(D) Drip or bubbler irrigation systems are required for trees with the exception of those which can be sustained by ground or rain water.

(E) Sprinkler heads must have matched precipitation rates within each control valve circuit.

(F) Serviceable check valves are required where elevation differential may cause low head drainage.

(G) Sprinkler head spacing shall be designed for head-to-head coverage. The system should be designed for minimum runoff and overspray onto nonirrigated areas.

(H) All irrigation systems shall be equipped with a controller capable of dual or multiple programming. Controllers must have multiple cycle start capacity and a flexible calendar program.

(5) Ornamental ponds. Water bodies that are part of the landscaping for new developments shall be restricted. Unless the water body is an integral part of the operations of the new development, the surface area of the water body

shall be counted as turf in the calculations for limitation of turf for the landscaped area. Fountains or other types of decorative bodies where water is sprayed into the air shall be discouraged. Some allowance will be made for fountains for ponds where reclaimed irrigation is used and the water supply is recirculated.

(6) Landscape plans. Landscape plans shall indicate the total landscape area, the area and percentage of drought-resistant plantings and the area and percentage of ornamental nondrought resistant plantings. The plans shall be reviewed by community development director or his designee to check for compliance with this section in regards to plant varieties, planting areas and irrigation design. Commercial, multiple dwellings, country clubs and condominiums shall be required to submit additional landscape plans which include a water budget that incorporates estimated annual water use (in gallons) and the area (in square feet) to be irrigated. Precipitation rates for each valve circuit and a monthly irrigation schedule for the plant establishment period including the year following shall be supplied as well. (Ord. No. 1012, § 1.)

ORDINANCE NO. 1012

AN ORDINANCE OF THE CITY COUNCIL OF THE CITY OF BANNING ADDING SECTION 31-4.5 TO THE BANNING ORDINANCE CODE ESTABLISHING XERISCAPE REQUIREMENTS

WHEREAS, the City of Banning recognizes that there is an increasing demand and a limited supply of water available; and

WHEREAS, studies have shown that landscaping accounts for about fifty percent of all water used in urban areas. Water conserving landscapes use only about one-third of the water of a traditional non-water conserving landscapes. If projected through the life of a development, these savings can be substantial; and

WHEREAS, Xeriscape techniques will not only benefit the property owner by saving money on their water bill, but will also benefit the community by conserving the limited resource of water; and

WHEREAS, water conservation measures will save money and can be accomplished without degradation of aesthetic values of developments; and

WHEREAS, for all of these reasons, it is in the interest of the public health, safety and welfare of the City to require water conservation methods for landscaping or new developments by regulation of turf and water area, planting materials, and irrigation practices; and

WHEREAS, consistent with California Government Code section 65596 The City Council has considered the provisions of the model water efficent landscape ordinance adopted by the California State Department of Water Resource;

NOW THEREFORE, BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF BANNING AS FOLLOWS:

Section 1. Section 31-4.5 is hereby added to the Banning Municipal Code to read as follows:

"Section 31-4.5 Xeriscape Requirements. The provision of this section shall apply to all development within the City of Banning unless otherwise specified by this Ordinance. This Ordinance shall not apply to those projects which have been approved or accepted as complete for processing prior to the effective date of this Ordinance; provided no material amendments or extensions are made to such previously approved projects.

Sections:

31-4.5.010	Purpose and Intent
31-4.5.020	Xeriscape Definition
31-4.5.030	Applicability
31-4.5.040	Requirements

31-4.5.010 Purpose and Intent. Water is an increasingly limited and costly resource. It is the intent of this chapter to establish a water conservation plan to reduce water consumption in the landscape environment using Xeriscape principles.

31-4.5.020 Xeriscape Definition. "Xeriscape" shall mean a combination of landscape features and techniques that in the aggregate reduce the demand for and consumption of water, including appropriate low water using plants, non-living ground-cover, a low percentage of turf coverage, permeable paving and water conserving irrigation techniques and systems.

31-4.5.030 Applicability.

(1) Except as provided for in Section 31-4.5.030 (3) this section shall apply to:

a. All new residential developments (including townhomes and apartment projects) on parcels greater than 7,000 square feet.

b. Rehabilitated landscaping (for projects on parcels greater than 10,000 square feet) for industrial, commercial, institutional, multi-family and residential common areas of PUDs (Planned Unit Developments).

c. Interior remodels, tenant improvements and demolitions for any of the above projects.

d. Schools, parks, golf courses or similar public open spaces.

e. Water conservation landscape requirements shall apply to all new developments. New development applications shall include landscape plans which require final approval at the time of final project approval.

(2) Projects Subject to this Section shall conform to the provisions in Section 31-4.5.

(3) This Section shall not apply to:

a. Homeowner-provided landscaping at single-family and multi-family projects:

b. Cemeteries;

c. Registered historical sites:

d. Ecological restoration projects that do not require a permanent irrigation system;

e. Mined-land reclamation projects that do not require a permanent irrigation system;

31-4.5.040 Requirements. Turf Limitation. The maximum allowed turf and/or water area (expressed as percent of planted area) shall be 25 percent for industrial, commercial, residential developments with common area, institutions and public/semi-public developments. If turf is an essential part of development, such as playing fields for schools or public parks, a higher percentage will be allowed, and will be evaluated on an individual basis. No turf shall be allowed in median strips or in areas less than eight feet wide.

If a residential development has one or more model homes, it is required that at least one model home in the development be planted with drought tolerant plants and a maximum of 25 percent turf and/or water area. Additionally, developers shall provide buyers with sample landscape plans using low water-using plants and a maximum 25 percent turf area. The developer shall also provide information about outdoor water conservation by distributing pamphlets to buyers regarding this subject. Such pamphlets are available from local water districts and the State Department of Water Resources. The County Community Development Department will have samples of appropriate types of pamphlets available. Landscape and distribution of literature shall require approval by the Community Development Department.

<u>Types of Plants in Non-Turf Areas</u>. At least 90 percent of the plants in non-turf areas shall be low water-requiring drought-resistant plants as approved by the Community Development Department. A small percentage of the planted area (up to 10%) can be used for non-drought tolerant varieties if they are grouped together and can be irrigated separately.

<u>Use of Mulch</u>. A minimum of two inches of mulch shall be added to the soil surface after planting. Non-porous material shall not be placed under the mulch.

<u>Irrigation</u>.

(1) Sprinklers and sprays shall not be used in areas less than eight (8) feet wide. Drip and bubbler shall be used that do not exceed 1.5 gallons per minute per device.

(2) Sprinkler heads with a precipitation rate of .85" per hour or less shall be used in slopes exceeding 15 percent to minimize runoff, or exceeding 10 percent within 10 feet of hardscape.

(3) Valves and circuits shall be separated based on water use.

(4) Drip or bubbler irrigation systems are required for trees with the exception of those which can be sustained by ground or rain water.

Note: A low water-using drought tolerant plant includes species suited to our climate, requiring less water in order to grow well.

Note: See the following section entitled Ornamental Ponds.

(5) Sprinkler heads must have matched precipitation rates within each control valve circuit.

(6) Serviceable check valves are required where elevation differential may cause low head drainage.

(7) Sprinkler head spacing shall be designed for head-to-head coverage. The system should be designed for minimum runoff and over spray onto non-irrigated areas.

(8) All irrigation systems shall be equipped with a controller capable of dual or multiple programming. Controllers must have multiple cycle start capacity and a flexible calendar program.

Ornamental Ponds. Water bodies that are part of the landscaping for new developments shall be restricted. Unless the water body is an integral part of the operations of the new development, the surface area of the water body shall be counted as turf in the calculations for limitation of turf for the landscaped area. Fountains or other types of decorative bodies where water is sprayed into the air shall be discouraged. Some allowance will be made for fountains or ponds where reclaimed irrigation is used, and the water supply is recirculated.

Landscape Plans. Landscape plans shall indicate the total landscape area, the area and percentage of drought resistant plantings and the area and percentage of ornamental non-drought resistant plantings. The plans shall be reviewed by Community Development Director or his designee to check for compliance with this ordinance in regards to plant varieties, planting areas and irrigation design. Commercial, Multiple Dwellings, Country Clubs and Condominiums shall be required to submit additional landscape plans which include a water budget that incorporates estimated annual water use (in gallons) and the area (in square feet) to be irrigated. Precipitation rates for each valve circuit and a monthly irrigation schedule for the plant establishment period including the year following shall be supplied as well.

Section 2. The Mayor shall sign this Ordinance and the City Clerk shall attest thereto and shall within fifteen (15) days cause it, or a summary of it, to be published in the Record Gazette, a local newspaper published and circulated in the City of Banning and thereupon and thereafter this Ordinance shall become effective on the 60th day after the date of its adoption.

PASSED, APPROVED, AND ADOPTED this 10th day of November 1992.

Robert Hanson, Mayor
City of Banning, California

APPROVED AS TO FORM
AND LEGAL CONTENT

John F. Wilson, Esq.
City Attorney

ATTEST:

Lucille M. Elizondo
City Clerk

CERTIFICATION:

I, LUCILLE M. ELIZONDO, City Clerk of the City of Banning, California, do hereby certify that the foregoing Ordinance No. 1012 was duly introduced at a regular meeting of the City Council of the City of Banning, held on the 27th day of October, 1992, and was duly adopted at a regular meeting of said City Council on the 10th day of November, 1992, by the following vote, to wit:

AYES:	Councilmembers Garcia, Holbert, Williams, Mayor Hanson
NOES:	None
ABSENT:	Councilmember Reynolds
ABSTAIN:	None

Lucille M. Elizondo, City Clerk
City of Banning, California

RECEIVED
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BY:________

ORDINANCE NO. 1040

ORDINANCE OF THE CITY COUNCIL OF THE CITY OF BANNING ADDING SECTION 31-7 TO CHAPTER 31 OF THE BANNING ORDINANCE CODE RESTRICTING WATER USE DURING WATER SUPPLY EMERGENCIES

WHEREAS, the City of Banning (hereinafter "City") is a public agency organized, among other purposes, to provide water service to the water users within the boundaries of the City; and

WHEREAS, the City is authorized by Water Code Appendix Section 100-15 (13) to restrict the use of City water during a threatened or existing water shortage, and to prohibit the waste or the use of City water during such periods for any purpose other than domestic uses or such other uses as may be determined by the City to be necessary; and,

WHEREAS, the City is further authorized by Water Code 350 et seq. to declare a water shortage emergency and by Water Code 375-377 to adopt water conservation programs; and

WHEREAS, the City finds and determines that the adoption of water conservation rules and regulations is necessary to (1) protect the health, safety and welfare of the inhabitants of the City, (2) assure the maximum beneficial use of the water supplies of the City, and (3) ensure that there will be sufficient water supplies to meet the basic needs of human consumption, sanitation and fire protection; and

WHEREAS, the City further finds that the specific rules, regulations and restrictions established herein are necessary in the event of an emergency which is the cause of a water supply shortage;

NOW, THEREFORE, BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF BANNING AS FOLLOWS:

Section 1. Section 31-7 is added to Chapter 31 of the Banning Ordinance Code to read as follows:

Section 31-7 Restricting Water Use During Water Supply Emergencies.

A. DEFINITIONS.

(1) "Agency" -- City of Banning.

(2) "Council" -- City Council of the City of Banning.

(3) "Emergency Supply Shortage" -- Any water shortage caused by an earthquake, loss of electrical power, pipe line breakage, or any other threatened or existing water shortage caused by a disaster or facility failure which results in City inability to meet the water demands of its customers.

(4) "Water Operations Superintendent" -- The Water Services Supervisor of the City of Banning.

(5) "Waste" -- Any unreasonable or non-beneficial use of water, or any unreasonable method of use of water, as determined by the Council, including, but not limited to, the specific uses prohibited and restricted by this Ordinance as hereinafter set forth.

(6) "Water users" -- Any person, firm, partnership, association, corporation or political entity using water obtained from the water system of the City of Banning.

(7) "Water" -- Water supplied by the City of Banning.

B. <u>NOTICED PUBLIC HEARING PRIOR TO MANDATORY CONSERVATION</u>.

Except when an emergency is caused by the breakage or failure of a dam, pump, pipe line or conduit, a noticed public hearing shall be held prior to the adoption of stages 2, 3 or 4 of the Water Supply Plan for Emergency Supply Shortage as set forth in Sections C(2), C(3) and C(4) below. Notice of the time and place of hearing shall be published at least seven days prior to the date of hearing in a newspaper printed, published, and circulated within the area in which the water supply is distributed, or if there is no such newspaper, in any newspaper printed, published, and circulated in the County in which the area is located.

C. <u>WATER SUPPLY PLAN FOR EMERGENCY SUPPLY SHORTAGE</u>.

(1) <u>Stage No. 1</u>. <u>Normal Conditions</u>: <u>Voluntary Conservation Measures</u>.

Normal conditions shall be in effect when the City is able to meet all the water demands of its customers in the immediate future. During normal conditions, all water users should continue to use water wisely, to prevent the waste or unreasonable use of water, and to reduce water consumption to that necessary for ordinary domestic and commercial purposes.

(2) <u>Stage No. 2</u>. <u>Water Shortage Alert</u>: <u>Mandatory Conservation Measures</u>.

In the event of a sudden and unexpected water supply shortage which could prevent the City from meeting the water demands of its customers, the Council shall immediately hold a public hearing at which consumers of the water supply shall have the opportunity to protest and to present their respective needs to the Council. No public hearing shall be required in the event of a breakage or failure of a dam, pump, pipe line on conduit causing an immediate emergency. The Council may then declare a water shortage emergency condition to prevail, and the following rules and regulations shall be in effect immediately following such declaration.

(a) washing driveways, parking lots, or other hard surfaced area, or building exteriors at any time, except to alleviate immediate fire hazards is prohibited;

(b) parks, golf courses and school grounds are to be irrigated during nighttime hours only, between sunset and sunrise;

(c) lawn watering and landscape irrigating, including construction meter use, is prohibited between the hours of 10:00 a.m. to 5:00 p.m.;

(d) running water shall not be used for washing privately owned vehicles. A bucket may be used for the washing of vehicles and only hoses equipped with shut-off nozzles may be used for rinsing;

(e) restaurants are requested not to provide drinking water to patrons except by request;

(f) commercial nurseries shall use water only during the hours from midnight to 6:00 a.m. Irrigation of propagation beds and watering of livestock is permitted as necessary during any hours.

(g) golf courses using reclaimed water are exempted from these restrictions.

(3) Stage No. 3. Water Shortage Warning. The Council may, following a public hearing as set forth in Section B(2), declare that an emergency water supply shortage exists, and that the Agency is unable to meet all the water demands of its customers. Immediately thereafter, the following water conservation measures shall apply:

(a) parks and schools shall be watered on alternate days during the hours between sunset to sunrise, the schedule of which shall be set following the public hearing.

(b) golf courses which utilize domestic water from the City of Banning's domestic system may irrigate greens only during the hours between sunset to sunrise. Golf courses utilizing reclaimed water are exempted from this restriction;

(c) other lawn watering and landscape irrigating, including construction meter use, are restricted as follows: customers with even numbered street addresses may water only on even numbered days, customers with odd numbered street addresses may water only on odd numbered days, and no watering or irrigating shall be done between the hours of 10:00 a.m. and 5:00 p.m. on any day;

(d) washing down of driveways, parking lots, or other paved surfaces is prohibited;

(e) washing of vehicles is restricted to commercial car wash establishments which recycle their water;

(f) filling or adding water to swimming pools, wading pools, spas, ornamental ponds, fountains and artificial lakes is prohibited;

(g) restaurants shall not serve drinking water to patrons except by request;

(h) no new construction meter permits shall be issued by the Agency;

(i) construction metered water shall not be used for earth work or road construction purposes;

(j) water of livestock is permitted as necessary during any hours;

(k) commercial nurseries may use water only between the hours of midnight and 6:00 a.m. Irrigation of propagation beds is permitted as necessary during any hours. Commercial nurseries utilizing reclaimed water are exempted from this restriction.

(4) <u>Stage No. 4</u>. <u>Mandatory Compliance. Water Shortage Emergency</u>.

Following a declaration by the City Council that an emergency water supply shortage due to a major failure in a supply of distribution facility exists, the following water conservation measures shall apply:

(a) watering of parks, school grounds and golf courses is prohibited, except by reclaimed water;

(b) watering of lawn and irrigating of landscape is prohibited;

(c) washing down of driveways, parking lots, or other paved surfaces is prohibited;

(d) washing of vehicles is prohibited, except when done by commercial car wash establishments using recycled or reclaimed water;

(e) filling or adding water to swimming pools, wading pools, spas, ornamental ponds, fountains and artificial lakes is prohibited;

(f) no serving of drinking water by restaurants to patrons except by request;

(g) no issuing of new construction meter permits by the City of Banning;

(h) turning off and locking all existing construction meters;

(i) discontinuing all watering and irrigating of commercial nurseries. Those utilizing reclaimed water are exempted from this restriction. Watering of livestock is permitted as necessary.

D. <u>COUNCIL DISCRETION TO MODIFY CONSERVATION MEASURES UPON A SHOWING OF NECESSITY THEREFOR</u>.

The specific requirements of each mandatory conservation stage shall be effective upon adoption by the Council following a public hearing, except that the Council may modify or amend such requirements at the time of adoption upon a showing of the need for such modification or amendment.

E. IMPLEMENTATION AND TERMINATION OF MANDATORY COMPLIANCE STAGES.

The Water Operations Superintendent of the City of Banning shall monitor the supply and demand for water on a daily basis to determine the level of conservation required by the implementation or termination of the Water Conservation Stages, and shall notify the Council of the necessity for the implementation or termination of each stage. Each declaration of the Council implementing or terminating a water conservation stage shall be published at least once in a newspaper of general circulation, and shall remain in effect until the City Council otherwise declares, as provided herein.

F. EXCEPTIONS.

Application for Exception Permit. The Water Operations Superintendent of the City of Banning may grant permits for uses of water otherwise prohibited thereby if he/she finds and determines that special circumstances make compliance not reasonably possible, or that restrictions herein would either:

(1) cause an unnecessary and undue hardship to the water user or the public; or

(2) cause an emergency condition affecting the health, sanitation, fire protection or safety of the water user or of the public.

Such exceptions may be granted only upon application therefor. Upon granting any such exception permit, the Water Operations Superintendent may impose any conditions he/she determines to be just and proper.

G. CRIMINAL PROCEEDINGS FOR VIOLATION.

The City Council hereby declares that, pursuant to Water Code Section 377, it shall be a misdemeanor for any person to use or apply water contrary to or in violation of any mandatory restriction or requirement established by this Ordinance and, upon conviction thereof, that person, firm or corporation shall be punished by imprisonment in the county jail for not more than thirty (30) days or a fine of not more than one thousand dollars ($1000) or by both such fine and imprisonment.

H. CIVIL PROCEEDINGS FOR VIOLATION.

In addition to criminal penalties, violators of the mandatory provisions of this Ordinance shall be subject to civil action initiated by the City.

(1) First Violation. For a first violation, the City shall issue a written notice of violation to the water user violating the provisions of this Ordinance.

(2) Second Violation: 25% Surcharge. For a second violation of this Ordinance within a 12-month period, a one-month surcharge is hereby imposed in an amount equal to 25% of

the previous month's water bill for the meter through which the wasted water was supplied.

(3) Third Violation: 50% Surcharge; Installation of Flow Restrictor. For a third violation of this Ordinance within a 12-month period, a one-month penalty surcharge is hereby imposed in an amount equal to 50% of the previous month's water bill for the meter through which the wasted water was supplied. In addition to the surcharge, the Agency may at its discretion install a flow-restricting device at such meter with a one-eighth-inch orifice for services up to one and one-half-inch size, and comparatively sized restrictors for larger services, on the service of the customer at the premises at which the violation occurred, for a period of not less than 48 hours. The charge for installing a flow-restricting device shall be based upon the size of the meter and the cost of installation but shall not be less than $25. The charge for removal of the flow-restricting device and restoration of normal service shall be $25 if restriction of normal service is performed during the hours of 7:00 a.m. to 3:30 p.m. on regular working days. If the removal of the flow-restricting device and restoration of normal service is made after regular working hours, on holidays or weekends, the restoration service charge shall be $40.

(4) Subsequent Violations; Discontinuance of Service. For any subsequent violation of this Ordinance within the 24 calendar months after a first violation as provided in Section H(1) hereof, the penalty surcharge provided in Section H(3) hereof

shall be imposed and the City shall discontinue water service to that customer at the premises or to the meter where the violation occurred. The charge for reconnection and restoration of normal service shall be $25. Such restoration of service shall not be made until the Water Operations Superintendent of the City of Banning has determined that the water user has provided reasonable assurances that future violations of this Ordinance by such user will not occur.

I. <u>NOTICE</u>.

(1) For a first violation, written notice may be given to the customer personally or by certified mail.

(2) If the penalty assessed is a surcharge for a second or third violation, notice may be given by certified mail.

(3) If the penalty assessed is, or includes, the installation of a flow restrictor or the discontinuance of water service to the customer for any period of time whatever, notice of the violation shall be given in the following manner:

(a) By giving written notice thereof by certified mail or to the customer personally; or

(b) If he/she is absent from his/her place of residence and from his/her assumed place of business, by leaving a copy with some person of suitable age and discretion at either place, and sending a copy through the United States mail, certified, addressed to the customer at either his/her place of business or residence; or

(c) If such place of residence and business cannot be ascertained, or a person of suitable age or discretion cannot be found, then by affixing a copy in a conspicuous place on the property where the failure to comply is occurring and also by delivering a copy to a person residing, if such person can be found, and also sending a copy through the United States mail, certified, addressed to the customer at the place where the property is situated.

(4) Any notice provided hereunder shall contain, in addition to the facts of the violation, a statement of the possible penalties for each violation and a statement of the possible penalties for each violation and a statement informing the customer of his right to a hearing on the violation.

J. HEARING.

Any customer against whom a penalty is levied pursuant to Subsections G and H shall have a right to a hearing, in the first instance by the Water Operations Superintendent, with the right of appeal to the City Council, on the merits of the alleged violation upon the written request of that customer within fifteen (15) days of the date of infraction of the violation.

K. RESERVATION OF RIGHTS.

The rights of the City hereunder shall be cumulative to any other right of the City to discontinue service. All monies collected by the Department pursuant to any of the penalty provisions of this Chapter shall be deposited in the

Operating Fund as reimbursement for the City's costs and expenses of administering and enforcing this Ordinance.

L. <u>CONCURRENT AUTHORITY</u>.

The City Manager, its Water Operations Superintendent and designated employees, have the duty and are hereby authorized to enforce all provisions of this Ordinance, with the qualification that the City of Banning through enforcement of Section 31-7 of the Banning Ordinance Code, the County of Riverside as to unincorporated territory within the City, are recognized to have concurrent authority for, and shall have the primary responsibility for the control of water flowing in the streets where such occurs within their respective jurisdictions.

M. <u>NO REPEAL OR AMENDMENT OF ORDINANCE 1039</u>.

This Ordinance shall be in addition to Ordinance 1039 (prohibiting the waste of water). In the event of conflicting provision, this Ordinance shall prevail.

N. <u>SEVERABILITY</u>.

If any section, subsection, sentence, clause or phrase of this Ordinance is for any reason held to be unconstitutional or invalid, such decision shall not affect the validity of the remaining portions of this Ordinance.

<u>Section 2.</u> The Clerk of the City of Banning shall attest to the passage of this Ordinance and shall cause the same to be published in a newspaper of general circulation, which is printed, published and circulated in the district within 10 (ten) days after its adoption.

PASSED, APPROVED AND ADOPTED this 24th day of September, 1991.

Robert Hanson, Mayor
City of Banning, California

APPROVED AS TO FORM
AND LEGAL CONTENT:

John F. Wilson
City Attorney

ATTEST:

Lucille M. Elizondo
City Clerk

CERTIFICATION

I, LUCILLE M. ELIZONDO, City Clerk of the City of Banning, do hereby certify that the foregoing Ordinance was duly introduced at a regular meeting of the City Council of the City of Banning, California, held on the 10th day of September, 1991, and was duly adopted at a regular meeting of said City Council held on 24th day of September, 1991, by the following vote to wit:

AYES:	Councilmembers Garcia, Reynolds, Williams, Mayor Hanson
NOES:	Councilmember Holbert
ABSTAIN:	None
ABSENT:	None

Lucille M. Elizondo, City Clerk
City of Banning, California

(S E A L)

ORDINANCE NO. 1231

A ORDINANCE OF THE CITY COUNCIL OF THE CITY OF BANNING, CALIFORNIA, APPROVING THE URBAN WATER MANAGEMENT/CONSERVATION PLAN, AND REPEALING THE ORDINANCE NO. 990 AND NO. 1039

WHEREAS, California Water Code Section 10610 requires each and every water purveyor to establish an Urban Water Management/Conservation Plan; and

WHEREAS, the City has the option to adopt its own Urban Conservation Plan and to be a signatory party of the State Memorandum of understanding;

WHEREAS, the City has elected to adopt its own Water Conservation Plan;

WHEREAS, it is essential that this Urban Water Management Plan be adopted in order to comply with the Urban Water Planning Act; and

WHEREAS, the City is in the process of obtaining the low interest loan under the State Revolving Loan Program; and

WHEREAS, the State requires that the City adopt the Urban Water Management Plan prior to the approval of the loan; and

WHEREAS, Ordinance No. 990 and No. 1039, are being incorporated in the new Urban Water management/Conservation plan as one of the Best Management Practices;

NOW THEREFORE, BE IT RESOLVED by the City Council of the City of Banning does hereby ordain as follows:

Section I. The City of Banning hereby adopts the Urban Water Management/Conservation Plan, a copy of which is attached hereto as Exhibit A.

Section II. Ordinance No.'s 990 and 1039 are hereby repealed.

Section III. This Ordinance is approved and signed this 11th day of August, 1998.

John Hunt, Mayor

APPROVED AS TO FORM AND
LEGAL CONTENT:

John F. Wilson, City Attorney

ATTEST:

Marie A. Calderon, City Clerk

CERTIFICATION

I, Marie A. Calderon, City Clerk of the City of Banning, do hereby certify that the foregoing Ordinance No. 1231 was duly introduced at a regular meeting of the City Council of the City of Banning, California, held on the 28th day of July, 1998, and was duly adopted at a regular meeting of said City Council held on the 11th day of August, 1998, by the following vote, to wit:

AYES:	Councilmembers Jenkins, Lucsko, Palmer, Williams, Mayor Hunt
NOES:	None
ABSTAIN:	None
ABSENT:	None

Marie A. Calderon, City Clerk
City of Banning

ORDINANCE NO. 1320

AN ORDINANCE OF THE CITY OF BANNING AMENDING SECTION 31-4, SUBSECTION (A) OF THE BANNING MUNICIPAL ORDINANCE CODE RELATING TO WATER SYSTEM CONNECTION FEES.

WHEREAS, Ordinance No. 965 established a water system connection fee for all new water connections within the City of Banning and which ordinance is codified as Section 31-4, Subsection (a) of the Banning Municipal Ordinance Code; and

WHEREAS, the City Council of the City of Banning has determined that the connection : established in Banning Municipal Ordinance Code Section 31-4, Subsection (a) should increased to reflect the increased costs to the City of Banning providing water connections and capacity; and

WHEREAS, based on reports of City staff and evidence presented at a duly noticed public hearing, the City Council finds the water system connection fee established by this Ordinance is structured so that the cost of the capital facilities funded hereunder are apportioned relative to the anticipated impact on water capital facilities of new development within the City and that the fees are fairly apportioned throughout the City on the basis of benefits conferred on the property proposed for development; and

WHEREAS, the water system connection fee increase is recommended in accordance with the Banning Municipal Ordinance Code; and

WHEREAS, Section 5471 of the Health and Safety Code and Section 31-2 of the Banning Municipal Ordinance Code require that the establishment of or increase in water system connection fees be adopted by ordinance approved by a two-thirds vote of the members of the City Council;

NOW, THEREFORE, BE IT ORDAINED, by the City Council of the City of Banning as follows:

<u>Section I.</u> Section 31-4. Water System Connection Fee, Subsection (a) of the Banning Municipal Ordinance Code is amended to read as follows:

All applicants for water service shall pay a water connection fee of Seven Thousand Two Hundred and Thirty-Two Dollars ($7,232.00) for each equivalent dwelling unit. This amount is necessary to cover the reasonable cost of the water service to be rendered.

<u>Section II.</u> The Mayor shall sign this Ordinance and the City Clerk shall attest thereto and shall within fifteen (15) days cause it, or a summary of it, to be published in the Banning Record Gazette, a newspaper published and circulated in the City of Banning and thereupon and thereafter this Ordinance shall become effective the 30th day after the date of its adoption.

PASSED, APPROVED, AND ADOPTED this 14th day of December, 2004.

John Machisic, Mayor

APPROVED AS TO FORM
AND LEGAL CONTENT:

Julie Hayward Biggs, City Attorney

ATTEST:

Marie A. Calderon, City Clerk

CERTIFICATION

I, Marie A. Calderon, City Clerk of the City of Banning, do hereby certify that the foregoing Ordinance No. 1320 was duly introduced at a regular meeting of the City Council of the City of Banning, California, held on the 23rd day of November, 2004, and was duly adopted at a regular meeting of said City Council held on the 14th day of December, 2004, by the following vote, to wit:

AYES:	Councilmembers Hanna, Salas, Welch, Mayor Machisic
NOES:	None
ABSTAIN:	None
ABSENT:	Mayor Pro Tem Palmer

Marie A. Calderon, City Clerk
City of Banning

ORDINANCE NO. 1321

AN ORDINANCE OF THE CITY OF BANNING AMENDING SECTION 31-5, SUBSECTION (A) OF THE BANNING MUNICIPAL ORDINANCE CODE RELATING TO WASTEWATER CONNECTION FEES.

WHEREAS, Ordinance No. 966 established a wastewater connection fee for all ne wastewater connections within the City of Banning and which ordinance is codified as Sectic 31-5, Subsection (a) of the Banning Municipal Ordinance Code; and

WHEREAS, the City Council of the City of Banning has determined that the connection fee established in Banning Municipal Ordinance Code Section 31-5. Sewer System Connection Fee, Subsection (a) General, Item No. 1, should be raised to reflect the increased costs to the City of Banning in providing wastewater connections and capacity; and

WHEREAS, based on reports of City staff and evidence presented at a duly noticed public hearing, the City Council finds the wastewater connection fee established by Ordinance No. 1321 is structured so that the costs of the capital facilities funded hereunder are apportioned relative to the anticipated impact on wastewater capital facilities of new developments within the City and that the fees are fairly apportioned throughout the City on the basis of benefits conferred on the property proposed for development; and

WHEREAS, the wastewater connection fee increase is recommended in accordance with the Banning Municipal Ordinance Code; and

WHEREAS, Section 5471 of the Health and Safety Code and Section 31-2 of the Banning Municipal Ordinance Code requires that the establishment of or increase in wastewater connection fees be adopted by ordinance approved by a two-thirds vote of the members of the City Council; and

NOW, THEREFORE, BE IT ORDAINED, by the City Council of the City of Banning as follows:

Section I. Section 31-5. Sewer System Connection Fee, Subsection (a) General, Item No. 1 of the Banning Municipal Ordinance Code is amended to read as follows:

(A) General

A sewer system connection fee shall be paid for a new connection to the City- owned sewerage system as follows:

(1) The connection fee shall be Two Thousand Seven Hundred and Eighty-Six Dollars ($2,786.00) per equivalent dwelling unit. This

PASSED, APPROVED, AND ADOPTED this 14th day of December, 2004.

John Machisic, Mayor

APPROVED AS TO FORM
AND LEGAL CONTENT:

Julie Hayward Biggs, City Attorney

ATTEST:

Marie A. Calderon, City Clerk

CERTIFICATION

I, Marie A. Calderon, City Clerk of the City of Banning, do hereby certify that the foregoing Ordinance No. 1321 was duly introduced at a regular meeting of the City Council of the City of Banning, California, held on the 23rd day of November, 2004, and was duly adopted at a regular meeting of said City Council held on the 14th day of December, 2004, by the following vote, to wit:

AYES:	Councilmembers Hanna, Salas, Welch, Mayor Machisic
NOES:	None
ABSTAIN:	None
ABSENT:	Mayor Pro Tem Palmer

Marie A. Calderon, City Clerk
City of Banning

Ord. No. 1321

APPENDIX J

City of Banning Historical Water Quality

GEOSCIENCE

Select Historical Water Quality Constituents in the City of Banning Water Resource Area

Well Name	Date	Aluminum [µg/L] 50 µg/L[1]	Arsenic [µg/L] 6 µg/L[1]	Chloride [mg/L] 250 mg/L[2]	Iron [µg/L] 300 µg/L[2]	Manganese [mg/L] 0.05 mg/L[2]	Nitrate (as NO3) [mg/L] 45 mg/L[1]	TDS [mg/L] 500 mg/L[2]
City of Banning Well 01	06-Dec-84		ND	4	ND	ND	7	135
	30-Jan-94	170		113.49	130	3	6.6	626
	07-Mar-94	ND	ND	10	ND	ND	2	165
	16-Feb-95			10		3	1.25	290
	26-Oct-95						32	
	05-Sep-96	0	0	3	0	0	2.7	170
	13-Sep-96		96	14	180		5.2	216
	29-Sep-98			18			15.9	390
	02-Mar-99	0	0	2	0	0	3	180
	02-Aug-00			26			8	310
	02-Oct-01		2	16.1			12.6	263
	01-Oct-02		ND	16.3			9.1	185
	29-Oct-02	52	0	5.7	0	0	4	240
	19-Dec-02							
	25-May-05						6.3	220
	27-Jun-05			2.4			3.3	190
	29-Jun-05			2.4			3.2	190
	30-Jun-05			2.4			3.9	210
	05-Jan-06	ND	ND	2.4	ND	ND	3.1	190
	20-Apr-06						3.3	
	10-Apr-07						3.2	
	28-Apr-08						3.9	
	27-Jan-09	ND	ND	2.4	ND	ND	4.5	210
	03-Feb-09							
City of Banning Well 02	17-Apr-84		ND	7	ND	ND	3	175
	07-Mar-94	ND	ND	3	ND	ND	3	170
	05-Sep-96	0	0	7	0	0	6.2	230
	02-Mar-99	0	0	3	0	0	3	160
	29-Oct-02	0	0	14	0	0	8	360
	25-May-05			2.6	150		5.6	190
	05-Jan-06	ND	ND	2.6	150	ND	2.8	190
	20-Apr-06						6.5	
	17-Apr-07			2.6	150		3.5	190
	28-Apr-08			2.8			6.9	200
	04-Feb-09	ND	ND	2.8	ND	ND	4.2	200
City of Banning Well 03	06-Dec-84		ND	12	ND	ND	8	225
	07-Mar-94	ND	ND	2	130	ND	1	170
	05-Sep-96	0	0	10	0	0	6.2	260
	02-Mar-99	0	0	3	0	0	2	150
	19-Dec-02	0	0	15	0	0	9	310
	01-Jan-05			2.3				180
	25-May-05						5.5	190
	05-Jan-06	ND	ND	2.3	ND	ND	2.7	180
	20-Apr-06						7.3	
	10-Apr-07			2.3	150		5.3	180

Select Historical Water Quality Constituents in the City of Banning Water Resource Area

Well Name	Date	Aluminum [μg/L] 50 μg/L[1]	Arsenic [μg/L] 6 μg/L[1]	Chloride [mg/L] 250 mg/L[2]	Iron [μg/L] 300 μg/L[2]	Manganese [mg/L] 0.05 mg/L[2]	Nitrate (as NO3) [mg/L] 45 mg/L[1]	TDS [mg/L] 500 mg/L[2]
City of Banning Well 03 cont.	01-Jan-08			3.8				170
	28-Apr-08						7.5	
	03-Feb-09	ND	ND	3.8	ND	ND	4.8	170
	05-May-09						5.3	
City of Banning Well 04	13-Jan-84		ND	5	ND	ND	ND	150
	06-Dec-84		ND	9	ND	ND	1	160
	09-Mar-94	ND	ND	3	410	ND	2	165
	03-Mar-99	0	0	2	0	0	ND	180
	25-May-05	ND	ND	2.1	ND	ND	3.6	180
	11-Jan-06	ND	ND	2.7	ND	ND	2.8	190
	20-Apr-06						3	
	17-Apr-07			2.7			2.5	
	28-Apr-08						3.6	
	25-Feb-09	ND	ND	2.2	ND	ND	2.8	180
	01-Jun-09							
City of Banning Well 05	06-Dec-84		ND	7	530	ND	1	165
	10-Mar-94	ND	ND	2	ND	ND	ND	160
	26-Oct-95						21	
	05-Sep-96	0	0	3	0	0	2.2	180
	02-Mar-99	0	0	3	0	0	2	180
	01-Jul-03	0	0	2.7	0	0		180
	01-Jan-05			2.7	160			
	25-May-05						3.1	170
	11-Jan-06	ND	ND	2.7	160	ND	2.8	190
	01-Jan-07			2.7	160			190
	29-Jan-07						2.4	
	29-Jan-08						5.4	
	03-Mar-09	ND	ND	3	ND	ND	5.5	180
City of Banning Well 06 - DESTROYED	08-Jan-90	200	ND	4	920	10	16	185
	08-Mar-94	ND	ND	5	ND	ND	13	210
City of Banning Well 07	06-Dec-84		ND	5	ND	ND	ND	160
	07-Mar-94	ND	ND	3	ND	ND	1	175
	05-Sep-96	0	0	2	0	0	ND	160
	02-Mar-99	0	0	2	0	0	ND	170
	06-Nov-02	0	0	3.5	0	0	ND	220
	25-May-05						4.5	220
	09-Jan-06	ND	ND	2.6	ND	ND	1.8	200
	20-Apr-06						1.9	
	10-Apr-07			2.6			1.4	200
	21-Apr-08						2.3	
	21-Jan-09	ND	ND	1.8	ND	ND	1.6	230
	19-May-09						1.2	
City of Banning Well 08	06-Dec-84		ND	5	ND	ND	1	170
	02-Mar-90	ND	ND	2	730	ND	ND	205

Select Historical Water Quality Constituents in the City of Banning Water Resource Area

Well Name	Date	Aluminum [μg/L] 50 μg/L[1]	Arsenic [μg/L] 6 μg/L[1]	Chloride [mg/L] 250 mg/L[2]	Iron [μg/L] 300 μg/L[2]	Manganese [mg/L] 0.05 mg/L[2]	Nitrate (as NO3) [mg/L] 45 mg/L[1]	TDS [mg/L] 500 mg/L[2]
	07-Mar-94	ND	ND	3	ND	ND	1	185
City of Banning Well 08 cont.	05-Sep-96	0	0	3	0	0	2.2	170
	02-Mar-99	0	0	4	0	0	ND	160
	19-Dec-02	140	0	3.4	580	0	ND	200
	01-Jan-05			3	180		1.8	290
	25-May-05						2.5	220
	10-Jan-06	ND	ND	3	180	ND	2.2	170
	20-Apr-06						1.8	
	17-Apr-07			3	180		1.5	170
	21-Apr-08						1.7	
	13-Jan-09	ND	ND	4.1	ND	ND	2.5	170
	26-May-09						ND	
City of Banning Well 09	08-Jan-90	ND	ND	2	260	ND	ND	210
	08-Mar-94	ND	ND	2	ND	ND	ND	175
	05-Sep-96	0	0	3	0	0	ND	200
	01-Jul-02	0	0	11	0	0	7	250
	05-Nov-02	0	0	2.1	0	0	ND	200
	01-Jan-05			3.3				
	25-May-05						1.5	220
	04-Jan-06	ND	ND	3.3	ND	ND	2.4	290
	20-Apr-06						2.1	
	17-Apr-07			3.3			2	290
	21-Apr-08						1.2	
	13-Jan-09	ND	ND	1.5	ND	ND	1.1	220
	26-May-09						ND	
City of Banning Well 10 (LEWIS)	08-Jan-90	ND	ND	1	50	ND	ND	190
	08-Mar-94	50	ND	2	ND	ND	1	195
	05-Sep-96	0	0	2	0	0	2.2	170
	03-Mar-99	60	0	2	130	0	ND	200
	05-Nov-02	0	0	1.7	0	0	ND	180
	01-Jan-05			1.9				
	25-May-05						1.8	140
	04-Jan-06	ND	ND	1.9	ND	ND	1.9	180
	20-Apr-06						1.4	
	17-Apr-07			1.9			1.1	180
	21-Apr-08						1.3	
	13-Jan-09	ND	ND	1.2	ND	ND	1.1	250
	26-May-09						1.2	
City of Banning Well 11	08-Jan-90	ND	ND	1	90	ND	ND	190
	08-Mar-94	ND	ND	2	130	ND	ND	175
	05-Sep-96	0	0	1	270	0	ND	180
	03-Mar-99	0	0	2	110	0	ND	190
	05-Mar-03	0	0	1.3	140	0	ND	220
	01-Jan-05	120		1.9				
	25-May-05						1.7	170

Select Historical Water Quality Constituents in the City of Banning Water Resource Area

Well Name	Date	Aluminum [µg/L] 50 µg/L[1]	Arsenic [µg/L] 6 µg/L[1]	Chloride [mg/L] 250 mg/L[2]	Iron [µg/L] 300 µg/L[2]	Manganese [mg/L] 0.05 mg/L[2]	Nitrate (as NO3) [mg/L] 45 mg/L[1]	TDS [mg/L] 500 mg/L[2]
	04-Jan-06	120	ND	1.9	1200	29	1.8	210
City of Banning Well 11 cont.	22-Feb-06				ND			
	20-Apr-06						1.4	
	08-Jun-06							
	17-Apr-07	120		1.9		29	1	210
	21-Apr-08						1.5	
	21-Jan-09	ND	ND	1.2	ND	ND	1	170
	26-May-09						1.2	
City of Banning Well 12	29-Jun-05			1.8	140			190
	08-Jan-90	ND	ND	1	20	ND	ND	195
	08-Mar-94	110	ND	2	280	ND	ND	180
	05-Sep-96	0	0	2	100	0	ND	180
	03-Mar-99	0	0	2	110	0	ND	200
	21-Jul-01	0	0	13	0	0	8	190
	05-Mar-03	0	0	1.5	0	0	ND	200
	01-Jan-05			1.8	140			
	25-May-05						1.3	160
	04-Jan-06	ND	ND	1.8	140	ND	1.2	190
	20-Apr-06						1.3	
	17-Apr-07						ND	
	21-Apr-08						1.3	
	21-Jan-09	ND	ND	1.4	ND	ND	ND	180
	26-May-09						1.2	
City of Banning Well C-02 - ABANDONED	07-Dec-84		ND	14		ND	11	215
City of Banning Well C-02A	10-Jan-86		ND	11	ND	ND	6	205
	20-Apr-94	250	ND	12	460	ND	7	245
	05-Sep-96	50	0	10	490	0	6.2	230
	03-Mar-99	0	0	8	110	0	8	230
	06-Nov-02	0	0	8.3	0	0	5	260
	01-Jan-05	130		10			9.9	210
	25-May-05						9.7	260
	10-Jan-06	130	ND	10	490	ND	8	210
	06-Feb-06				ND			
	20-Apr-06						9.9	
	24-Apr-07	130		10			5.5	210
	14-Apr-08			8.9			7.1	240
	04-Feb-09	ND	ND	8.9	ND	ND	7.3	240
	28-Apr-09						7.5	
City of Banning Well C-03	02-Mar-90	ND	ND	11	30	ND	6	185
	07-Mar-94	120	ND	10	480	ND	6	200
	05-Sep-96	0	0	9	0	0	5.3	210
	02-Mar-99	360	0	11	440	0	8	170
	06-Nov-02	0	0	10	0	0	7	220
	25-May-05						6.8	230

Select Historical Water Quality Constituents in the City of Banning Water Resource Area

Well Name	Date	Aluminum [µg/L] 50 µg/L[1]	Arsenic [µg/L] 6 µg/L[1]	Chloride [mg/L] 250 mg/L[2]	Iron [µg/L] 300 µg/L[2]	Manganese [mg/L] 0.05 mg/L[2]	Nitrate (as NO3) [mg/L] 45 mg/L[1]	TDS [mg/L] 500 mg/L[2]
	11-Jan-06	ND	ND	10	ND	ND	6.9	180
City of Banning Well C-03 cont.	20-Apr-06						6.7	
	24-Apr-07			10			4.6	180
	14-Apr-08						6.3	
	04-Feb-09	ND	ND	9.2	ND	ND	6.7	180
	08-Jun-09						7	
City of Banning Well C-04	07-Mar-94	ND	ND	12	ND	ND	7	225
	28-Aug-95	ND	ND	13	ND	ND	9	230
	05-Sep-96	0	0	9	0	0	5.3	220
	09-Dec-96				0			
	02-Mar-99	0	0	9	0	0	7	210
	06-Nov-02			7.5		0.004	4	230
	01-Jan-05			9.8			5	210
	11-Jan-06	ND	ND	9.8	ND	ND	7.4	210
	20-Apr-06						5	
	24-Apr-07			9.8			5.2	210
	14-Apr-08						6.5	
	27-Jan-09	ND	ND	8.8	ND	ND	6.9	200
	05-May-09						6.5	
City of Banning Well C-05	8-Nov-90	ND	ND	12	90	ND	6	180
	7-Mar-94	90	5	17	800	ND	3	180
	28-Aug-95	ND	6	15	ND	ND	5	190
	27-Sep-95							
	1-Jul-96							
	5-Sep-96	0	5	13	0	0	8	180
	9-Dec-96							
	3-Mar-99	0	7	13	240	20	5	190
	29-Oct-02			11			5	190
	11-Jan-06	ND	3.5	13	ND	ND	5.4	180
	20-Apr-06						5.4	
	17-Apr-07			13			6.1	
	14-Apr-08						5.7	
	3-Feb-09	ND	ND	11	ND	ND	6	140
	28-Apr-09						5.8	
City of Banning Well C-06	5-Dec-90	ND	ND	14	70	ND	6	200
	10-Apr-03							
	26-Jul-06	170	ND	14	480	ND	6.4	240
	22-Aug-06				ND			
	17-Oct-06	ND		12	ND		1.8	210
	17-Apr-07			14			8.1	240
	14-Apr-08						7.7	
	19-May-09			12			6.7	230
	24-Jun-09	ND	ND	12	ND	ND	8.1	230
	1-Jan-05			11			8.7	160

Select Historical Water Quality Constituents in the City of Banning Water Resource Area

Well Name	Date	Aluminum [µg/L] 50 µg/L[1]	Arsenic [µg/L] 6 µg/L[1]	Chloride [mg/L] 250 mg/L[2]	Iron [µg/L] 300 µg/L[2]	Manganese [mg/L] 0.05 mg/L[2]	Nitrate (as NO3) [mg/L] 45 mg/L[1]	TDS [mg/L] 500 mg/L[2]
City of Banning Well M-10	31-May-05							
	12-Jan-06	ND	ND	11	ND	ND	9.2	160
City of Banning Well M-10 cont.	20-Apr-06						8.7	
	10-Apr-07			11			9.5	160
	28-Apr-08						8.9	
	24-Jun-09	57	ND	11	480	ND	9.4	180
City of Banning Well M-11	1-Jan-05			8.8	170		5.8	280
	31-May-05							
	12-Jan-06	ND	ND	8.8	170	ND	5.8	280
	20-Apr-06						5.8	
	10-Apr-07			8.8	170		4.5	280
	28-Apr-08						3.6	
	27-Jan-09	ND	3.3	7.2	ND	ND	ND	170
	5-May-09						3.6	
City of Banning Well M-12	1-Jan-05			8.5				
	2-Jan-05						4.6	
	3-Jan-05							180
	31-May-05							
	12-Jan-06	ND	ND	8.5	ND	ND	6.8	180
	20-Apr-06						4.6	
	10-Apr-07			8.5			6.3	180
	28-Apr-08						7.1	
	25-Feb-09	ND	ND	9.2	ND	ND	7.5	190
	23-Apr-09						6.4	
	1-Jun-09							
City of Banning Well M-3	1-Jan-05			16			7.8	280
	31-May-05							
	12-Jan-06	ND	ND	16	ND	ND	7.2	280
	20-Apr-06						7.8	
	17-Apr-07			16			7.1	280
	14-Apr-08						6.4	
	3-Feb-09	ND	ND	14	ND	ND	7.5	250
City of Banning Well M-7 - INACTIVE	1-Jan-05						8.9	
	31-May-05							
	20-Apr-06						8.9	
	10-Apr-07						8.7	
	27-May-08	ND	ND	13	ND	ND	8.5	190
	19-May-09						7.3	
Cabazon Water District Well 01	11-Feb-96			9	0	0	8.4	
	13-Aug-96	0	2				8.9	
	08-Mar-99			10	20	0	12.8	
	05-Apr-99							
	28-Feb-00							

Select Historical Water Quality Constituents in the City of Banning Water Resource Area

Well Name	Date	Aluminum [µg/L] 50 µg/L[1]	Arsenic [µg/L] 6 µg/L[1]	Chloride [mg/L] 250 mg/L[2]	Iron [µg/L] 300 µg/L[2]	Manganese [mg/L] 0.05 mg/L[2]	Nitrate (as NO3) [mg/L] 45 mg/L[1]	TDS [mg/L] 500 mg/L[2]
	20-May-02							
	19-May-03							
Cabazon Water District Well 01 cont.	04-May-05							
	11-May-06						7.9	250
	30-Jan-08						7	
	13-Nov-08	ND	ND	8.1	ND	ND	8.2	210
Cabazon Water District Well 02	06-Dec-95			6	ND	ND	7.1	
	11-Dec-96	130	0				7.1	
	08-Mar-99			6	0	0	8	
	05-Apr-99							
	28-Feb-00							
	20-May-02							
	19-May-03							
	04-May-05							
	11-May-06						6.8	230
	30-Jan-08						6.5	
	13-Nov-08	ND	ND	5.4	ND	ND	7.6	220
Cabazon Water District Well 03 (Formerly Jenson Well 01)	26-Nov-86		ND	7	ND	ND	ND	
	10-Aug-89	ND	ND	16	160	ND	21	
	13-Jul-93	ND	ND	13	ND	ND	13	
	29-Mar-95	ND	ND	25	100	ND	35	
	29-Dec-95	0	0	25	2300	0	30	
	17-Mar-97	0	0	24	250	0	30	
	27-Apr-98	0	0	21	0	0	33	
	03-Jun-09						23	
	11-Aug-09						20	
Cabazon Water District Well 04	26-Nov-86		ND	7	90	ND	ND	
	10-Aug-89	ND	ND	14	80	ND	10	

Select Historical Water Quality Constituents in the City of Banning Water Resource Area

Well Name	Date	Aluminum [µg/L] 50 µg/L[1]	Arsenic [µg/L] 6 µg/L[1]	Chloride [mg/L] 250 mg/L[2]	Iron [µg/L] 300 µg/L[2]	Manganese [mg/L] 0.05 mg/L[2]	Nitrate (as NO3) [mg/L] 45 mg/L[1]	TDS [mg/L] 500 mg/L[2]
Cabazon Water District Well 04 (Formerly Jenson Well 02) - DESTROYED cont.	22-Sep-93	ND	ND	15	650	ND	11	
	29-Mar-95	ND	ND	12	100		11	
	29-Dec-95	0	0	12	1000	0	9	
	17-Mar-97	0	0	13	690	0	8	
USGS Monitoring Well 3S/1E-11F1	16-Jul-09	8.5	0.43	13.5	2*	0.7		232
USGS Monitoring Well 3S/1E-11F2	16-Jul-09	5.3	1.3	15.2	2	3.6		264
USGS Monitoring Well 3S/1E-11F3	16-Jul-09	6.5	0.85	15.2	2*	3.8	25.9*	296
USGS Monitoring Well 3S/1E-11F4	16-Jul-09	17.9	5.1	13.8	10	1.2	39.7	338

* Estimated Value as displayed on USGS water Quality Website

Note: ND = Not Detected

Values of zero were as reported by the California Department of Human Services

[1] Primary MCL

[2] Secondary MCL

[3] US EPA Treatment Technique Value

GEOSCIENCE

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