City of Rio Vista Urban Water Management Plan 2010

1. Plan Preparation:

The City of Rio Vista (City), as defined in the California *Waster Code section 10617*, qualifies as an "Urban Water Supplier". The City is a public agency directly providing water for municipal purposes to more than 8,000 customers. As such, the City is required to complete an Urban Water Management Plan (UWMP) every five years. This is the first UWMP the City has filed with the State.

The preparation of the City's 2010 UWMP was completed by Dillon & Murphy and the City of Rio Vista., as provided for in the *California Water Code section 10620, paragraph (e)*. The 2010 UWMP has been prepared in conformance with the California Urban Water management planning act, *California Water Code division 6, part 2.6, Urban Water Management Planning*, and *California Assembly Bill 325, the "Water Conservation in Landscaping Act", passed by the State Legislature in September 1990*.

1.1.Coordination

During the preparation of the 2010 UWMP, the City coordinated information with Solano County and the Solano County Water Agency. *See Table 1 in Appendix E.*

Solano County was also contacted 60 days prior to a public hearing to review the 2010 UWMP, and 60 days after the submission of the 2010 UWMP to the California Department of Water Resources as per California Water Code sections 10621(b) and 10635 (b). *See Supporting Documents and Correspondence Appendix A.*

The 2010 UWMP was also sent to the California Department of Water Resources, the California State Library, and Solano County within 30 days of adoption by the City of Rio Vista City Council as per *California Water Code section 10644(a)*. *See Supporting Documents Appendix A.*

1.2. Plan Adoption, Submittal, and Implementation

The Act requires each urban water supplier to adopt and implement their UWMP once every five years. The process involves public review of the UWMP, revisions, and adoption by the governing body of the agency. The City's 2010 draft UWMP shall be reviewed by the City Council and general public during a public review meeting. The draft shall be revised as needed to address comments and concerns prior to adoption by the City Council. Once adopted by the City, UWMP shall be submitted to the Department of Water Resources.

A public hearing to discuss and receive comments regarding the City's 2010 UWMP was held at the June 16, 2011 City Council Meeting. The 2010 UWMP was made available for public review at the Public Works Department at Rio Vista City Hall commencing on June 1, 2011, per *California Water Code 10645. See Supporting documents Appendix A.*

The Rio Vista City Council adopted the 2010 UWMP by resolution at its _____ Council Meeting. *See Resolution to Adopt the 2010 UWMP in Appendix A.*

System Description:

2.1. Service Area Physical Description

The City of Rio Vista (The City) is located 48 miles southwest of Sacramento and 65 miles northeast of San Francisco. The City was incorporated on December 30, 1893. There are currently 4,225 acres of land within the City's water service boundary, of which 2,213 is currently developed. *See Water Service Boundary Map in Appendix D.*

The City includes a mix of rural and suburban lifestyles and easy access to the urban amenities of San Francisco and Sacramento. Rio Vista lies on the banks of the Sacramento River and is within an easy drive to the Napa Wine Country, Sierra ski resorts and Lake Tahoe.

In addition to the town proper, the City's Planning Area includes unincorporated surrounding areas located within the City's sphere of influence. These unincorporated areas may, in the future, request services from, or annexation to the City. The City's full planning area includes approximately 4,225 acres of unincorporated land.

The table below shows climatic information. The average rainfall and average temperature information comes from the National Weather Service from the Antioch Pump Plant 3 data center (period of record 1955 – 2010). The evapotraspiration data comes from the Twitchell Island California Irrigation Management Information System (CIMIS) Station.

Climate

	Jan	Feb	Mar	Apr	May	Jun	
Standard Monthly Avg. ETo	1.59	2.20	3.65	5.08	6.83	7.80	
Avg Rainfall (inches)	2.80	2.43	1.93	0.88	0.38	0.10	
Ave Temp (F)	45.3	50.6	54.4	58.8	64.85	71.1	
	July	Aug	Sep	Oct	Nov	Dec	Annual
Standard Monthly Avg. ETo	8.67	7.81	5.67	4.03	2.12	1.59	57.06
Avg Rainfall (inches)	0.02	0.05	0.21	0.70	1.66	2.12	13.28
Avg Temp (F)	74.1	7.34	70.7	63.9	53.5	45.9	60.5

2.2. Service Area Population

Present and projected population is shown in Table 2. Between 2010 and 2030 the City's population is expected to almost double. Present and project population was obtained from the State of California Department of Finance, and the Association of Bay Area Governments. *See Table 2 in Appendix E.*

Solano County requires that any urban development be annexed to a city (Solano County Orderly Growth Initiative, 1994). There are no urban populations in the unincorporated areas of Solano County. This initiative will continue to place annexation pressure on the City as undeveloped areas in the City's sphere of influence continue to develop.

3. System Demands:

3.1. Water Demands

Residential consumption was, is, and will continue to be the primary consumer of water within the Rio Vista. The remaining supply is used for commercial and governmental functions within the City.

Currently there are no existing sales of water to other agencies and there are no plans to sell water to other agencies. There are no additional water losses, or usages for saline barriers, groundwater recharging, or water recycling. All losses that occur are considered unaccounted for system losses. The City does not currently have the resources to establish a program for determining system losses. *See Tables 3-7, 9-11 in Appendix E.*

3.2. Baselines and Targets

Baseline and Target numbers were based on the requirements outlined in the 2010 Urban Water Management Guidebook, Section II, part M. Rio Vista used the metered water pumping data obtained at the individual well sites located in the service area. The aggregate total is reflected in the tables used to determine baselines and targets. *See Tables 13 and 15 in Appendix E.*

Based on Methodology 3 – Base Daily Per Capita Water Use, the City of Rio Vista has a 2020 GPCD target of 256 GPCD.

3.3. Water Demand Projections

Rio Vista is not a wholesale water supplier. Because of this, no projected data, per table 12, has been provided to DWR per subdivisions (b) and (c) (10631(k)). *See Table 12 in Appendix E.*

3.4. Water Use Reduction Plan

Rio Vista is not a wholesale water distributor. However, the City of Rio Vista is in the process of retrofitting, and installing water meters in the residential areas. Commercial and Industrial users have historically been metered.

The implications of charging users based on water consumption have historically shown a reduction in GPCD.

4. System Supplies:

4.1 Water Sources

The City has eight operating supply wells providing water for the entire system. Rio Vista does not import or export water at this time. Supplemental water sources include the Sacramento River and the North Bay Aqueduct (NBA). An agreement with the Solano County Water Agency, which controls the NBA water in Solano County, allows for access to the NBA supplemental water source. However, because Rio Vista is a significant distance from the NBA facility, it is more likely the City would trade its rights to that water for additional Sacramento River water if needed. Future water sources may include additional wells, recycled water, the Sacramento River, and purchased water from the Solano County Water Agency. *See Tables 16 and 17 in Appendix E.*

4.2. Groundwater Source

The City draws its water supply from the Solano Sub-basin at the southeastern limit of the Sacramento Valley Groundwater Basin. The Solano lies in the southwestern portion of the Sacramento Basin and the northern portion of the Sacramento-San Joaquin Delta. The elevation varies from 120 feet in the northwest corner to sea level in the south. Subbasin boundaries are defined by; Putah Creek on the north, the Sacramento River on the East (from Sacramento to Walnut Grove), the North Mokelumne River on the southeast (from Walnut Grove to the San Joaquin River), and the San Joaquin River on the South (from the North Mokelumne River to the Sacramento River. The western subbasin border is defined by the hydrologic divide that separates lands draining to the San Francisco Bay from those draining to the Sacramento-San Joaquin River Delta. That divide is roughly delineated by the English Hills and the Montezuma Hills.

Primary waterways in and bordering the basin include the Sacramento, Mokelumne, and San Joaquin Rivers, the Sacramento River Deep Water Ship Channel, and Putah Creek.

Annual precipitation averages in the basin range from approximately 23 inches in the western portion of the subbasin to 16 inches in the eastern portion of the basin. *(California Bulletin 118).*

The groundwater basin is currently not adjudicated.

The City commissioned *ENGEO Incorporated* to prepare 2002 report *Groundwater Evaluation for Rio Vista*. The report reevaluated the groundwater basin in and around the City limits to help determine the future capability of providing water for existing and planned developments. The report concludes that the groundwater basin will likely meet the future groundwater demands established by the projected population growth for the next 20 years. Monitoring the static and pumping levels of the wells in order to better understand the impacts of the increased demand on the aquifer is recommended.

California Bulletin 160, *California Water Plan Update 2005* provides no indication that the basin is in overdraft conditions. Bulletin 160 focuses on Bay Delta issues and water quality. California Bulletin 118 discusses the Solano Subbasin in detail. There is currently no calculated groundwater budget for the Solano Subbasin. A groundwater management plan has not been prepared for the Solano Groundwater Subbasin.

Water volumes that have been obtained from the service area wells can be found on Table 18 of this report. . In addition the volumes that are projected to be pumped are shown on Table 19 of this report. *See Tables 18 and 19 in Appendix E.*

Based on growth and demand, additional wells or other forms to obtain water are not planned for the foreseeable future.

4.3. Transfer Opportunities

Being surrounded by agricultural land, there are no active municipal water supply systems located adjacent to the city. Transfer and exchange opportunities are, therefore, limited.

As a member of the Solano County Water Authority, the City of Rio Vista eventually will hold rights to 1,500 acre feet of water from the North Bay Aqueduct project (NBA). The NBA is scheduled to begin water deliveries in 2016.

The location of the NBA makes it unlikely that the City will use NBA water directly. The cost to construct transmission facilities is too great. The possibility exists of an agreement to transfer water rights with the Solano County Water Agency for use of surface water from the Sacramento River in place of water from NBA. Such agreement, if needed, would likely be short-term during a significant dry weather period. *See Table 20 in Appendix E.*

4.4 Desalinated Water Opportunities

The City is not located adjacent to a supply of water high in total dissolved solids (TDS) that would warrant desalination; therefore desalinated water is not feasible.

4.5 Recycled Water Opportunities

Potential recycled water customers exist in the City and surrounding areas. Agriculture would be the largest potential customer, giving way over time to green belts and common areas as development continues to occur. The Trilogy development and it's surrounding golf course will be a primary user of this water. Infrastructure has been installed however more development will be needed to fully implement the usage of non-potable water at that location and future locations around the City.

The City of Rio Vista has two waste water treatment plants. The total amount of effluent treated is 235.4 million gallons of waste water per year. Only one third is treated to drinking water standards but due to the lack of redundancy in the process, it is not considered up to drinking

water standards. No water from these two treatment facilities are being used as recycled water within the service area boundaries. All treated water is pumped to the Sacramento River.

The data collected is from the treatment plants metering system. Information for the volumes of effluent treated can be found in *Tables 21 and 23 in appendix E.*

4.6 Future Water Projects

At this time, the City of Rio Vista has no water projects planned. As demands increase, the City will address the potential of increasing volumes of water for the city through additional wells in the service area. *See Table 26 in Appendix E.*

5. Water Supply Reliability and Water Shortage Contingency Planning:

5.1. Water Supply Reliability

The City has a single source of water, the Solano Groundwater Subbasin, historically used since incorporating in 1893. A groundwater management plan has not been prepared for the Solano Groundwater Subbasin.

Groundwater levels in the subbasin are impacted by periods of drought due to increased groundwater pumping and less surface water recharge (e.g. in the late 1970's). The subbasin does recover quickly in "wet" years. Historical trends indicate that water levels in the subbasin are not in decline.

Historically, the City's supply has matched demand during single-year and extended- period droughts. Because the groundwater basin does not have a water budget, and the City is experiencing lull in development, this report will use an increase based on a 10 year average of water delivered and projected to the year 2020. Based on historical pumping records the City is confident that demands can continue to be met with local groundwater. *See Tables 27 and 28 in Appendix E.*

5.2. Water Shortage Contingency Planning

The City does not currently have a Water Shortage Contingency ordinance requiring customer action or penalties due to noncompliance. The City does not anticipate future water shortages due to supply limitations. *See Tables 36 and 37 in Appendix E.*

Because the City uses groundwater exclusively for its supply, catastrophic supply interruptions are unlikely. A reasonable supply interruption scenario would be a regional power outage. In that event, the City has back-up generators at the well sites to provide the necessary power for continued well operation.

5.3. Water Quality

The City of Rio Vista has three wells that have arsenic levels at or above the MCL of 10 ppb. The City is currently blending two of said wells and producing water below the MCL. The third well has not been put on line since 2008 and a filtration system is currently in design.

5.4. Drought Planning

Because the groundwater basin has not been fully defined and there is no calculated groundwater budget, the nearest recorded potential water source (The Sacramento River) was used to determine the normal year, dry year and multiple dry year periods. Records of flow from the USGS Sacramento River Gauge 11447500 provides the Normal, Single Dry, and Multiple Dry year data as shown in Table 27. Unfortunately, City demand records during those periods are unavailable. Therefore, demand during drought periods is calculated as follows:

- It is assumed that under normal conditions water demand is approximately five times the low demand in the winter. Therefore, summer water demand accounts for 2/3 of the total yearly demand.

- It is also assumed that summer demand doubles during drought conditions. This is a highly conservative assumption, as the City does not have large swaths of greenbelts or large irrigation customers.

- Using the two assumptions above results in yearly drought demand that is 33% higher than normal demand.
  See Tables 27 and 28 in Appendix E.

The City does not currently have a Drought Contingency or Water Supply Reliability plan. To contend with power loss due to regional power outages, or earthquakes, the City has in place backup generators to continue to power the well sites and insure an uninterrupted delivery of water. The City does have mandatory measures that are put into effect during drought years such as reduction, or elimination of landscape watering of City owned land.

6. Demand Management Measurement:

Demand Management Measures are ways to conserve water through efficient tools, education, and incentives. Currently there are 14 best management practices (BMP's) that are promoted by California Urban Water Conservation Council (CUWCC). The City is not a current signatory to the California Urban Water Conservation Council.

Each BMP discussed in this section is to determine the current state of implementation by the City (if applicable).

i Water Survey Programs for Residential Customers

The City has not developed an independent survey program of single or multifamily residential customers to detect leaks. The City may consider beginning a water survey program to increase the visibility of the Public Works services. Such information could be supplied as a leaflet in the monthly water bill.

ii Residential Plumbing Retrofit

The City will be adopting the 2010 California Green Building Standards Code, and the 2010 California Plumbing Code, which specify various mandatory water conservation measures for residential uses including 1.28 gallon water closets and 0.5 gallon urinals after July 1, 2011.

iii System Water Audits

The City has an active SCADA system monitoring the Cities water well activity and other parameters. The city employees are also highly knowledgeable about the existing system. The City has been retrofitting the existing residential meters that have been installed in the newer subdivisions. Staff will begin reading meters, logging data, and billing by April 1, 2011. Additional meters will be installed as monies become available in the near future. Additionally, the City has been successful in continually repairing leaking mains in a timely fashion to assist in conservation and consistent water deliveries.

iv Commodity Rate Meeting

The City has just recently purchased a meter reading system to begin reading existing meters, and is in the process of implementing this new system. The City is anticipating installation of new meters to customers who in the past had none. This was due, in part, to the recommendations of the 2003 Water Master Plan.

v Large Landscape Conservation

On March 19, 2009, the City Council adopted Ordinance No. 643, adopting a water conservation and landscape ordinance to achieve water conservation through proper plant selection, installation and maintenance practices for landscaping associated with new commercial, industrial, institutional, mixed-use, common areas, multiple family, and new single family dwellings.

vi High Efficiency Washing Machines

The City may consider participating in a regional program that provides Residential High-Efficiency Clothes Washer Vouchers. More information about this potential needs to be provided.

vii Public Information Program

The City provides information to the public on a regular basis through the use of the City's internet homepage, mailings, and public meetings.

viii School Education Programs

The City does not have a School Education program at this time.

ix Conservation Programs for Commercial, Industrial, and Institutional Accounts

On March 19, 2009, the City Council adopted Ordinance No. 643, adopting a water conservation and landscape ordinance to achieve water conservation through proper plant selection, installation and maintenance practices for landscaping associated with new commercial, industrial and institutional uses.

x Conservation Pricing

The City does not have a Conservation Pricing program.

xi Wholesale Agency Programs

The City is not a Wholesale Agency.

xii Water Conservation Coordinator

Rio Vista's Planning Division reviews all new landscape plans for compliance with the cities water conservation and landscape ordinance, and inspects the landscaping for conformance with the approved plans.

xiii Waste Water Prohibition

The City does not have a Waste Water Prohibition Program.

xiv Residential Plumbing Retrofit

The City will be adopting the 2010 California Green Building Standards Code, and the 2010 California Plumbing Code, which specify various mandatory water conservation measures for residential uses including 1.28 gallon water closets and 0.5 gallon urinals after July 1, 2011.

APPENDIX A

- Contact Correspondence
- Supporting Documentation
- Resolution to Adopt the 2010 UWMP

APPENDIX B

- Sacramento Valley Groundwater Basin and Solano Subbasin

Sacramento Valley Groundwater Basin
Solano Subbasin

Groundwater Basin Number: 5-21.66
County: Solano, Sacramento, Yolo
Surface Area: 425,000 acres (664 square miles)

Basin Boundaries and Hydrologic Features

The Solano Subbasin lies in the southwestern portion of the Sacramento Basin and the northern portion of the Sacramento-San Joaquin Delta. The elevation varies from 120 feet in the northwest corner to sea level in the south. Subbasin boundaries are defined by; Putah Creek on the north, the Sacramento River on the East (from Sacramento to Walnut Grove), the North Mokelumne River on the southeast (from Walnut Grove to the San Joaquin River), and the San Joaquin River on the South (from the North Mokelumne River to the Sacramento River. The western subbasin border is defined by the hydrologic divide that separates lands draining to the San Francisco Bay from those draining to the Sacramento-San Joaquin River Delta. That divide is roughly delineated by the English Hills and the Montezuma Hills.

Primary waterways in and bordering the basin include the Sacramento, Mokelumne and San Joaquin Rivers, the Sacramento River Deep Water Ship Channel, and Putah Creek.

Annual precipitation averages in the basin range from approximately 23 inches in the western portion of the subbasin to 16 inches in the eastern portion of the basin.

Hydrogeologic Information

Water Bearing Formations

The primary water-bearing formations comprising the Solano subbasin are sedimentary continental deposits of Late Tertiary (Pliocene) to Quaternary (Recent) age. Fresh water-bearing units include younger alluvium, older alluvium, and the Tehama Formation (Thomasson and others 1960). The units pinch out near the Coast Range on the west and thicken to a section of nearly 3000 feet near the eastern margin of the basin. Saline water-bearing sedimentary units underlie the Tehama formation and are generally considered the saline water boundary (adapted from Thomasson and others, 1960).

Flood basin deposits occur along the eastern margin of the subbasin. These deposits consist primarily of silts and clays, and may be locally interbedded with stream channel deposits of the Sacramento River. In the delta, flood basin deposits contain a significant percentage of organic material (peat), and are sometimes mapped as peaty mud (Wagner and others 1987). Thickness of the unit ranges from 0 to 150 feet. The flood basin deposits have low permeability and generally yield low quantities of water to wells. Recent stream channel deposits consist of unconsolidated silt, fine- to medium-grained sand, gravel and in some cases cobbles deposited in and adjacent to active streams in the subbasin. They occur along the Sacramento, Mokelumne and San Joaquin Rivers, and the upper reaches of Putah Creek.

Thickness of the younger alluvium ranges from 0 to 40 feet, however with the exception of the Delta, they generally lie above the saturated zone.

Older alluvium consists of loose to moderately compacted silt, silty clay, sand, and gravel deposited in alluvial fans during the Pliocene and Pleistocene. Thickness of the unit ranges from 60 to 130 feet, about one-quarter of which is coarse sand and gravel generally found as lenses within finer sands, silts, and clays. Permeability of the older alluvium is highly variable. Wells penetrating sand and gravel lenses of the unit produce between 300 and 1000 gpm. Adjacent to the Sacramento River, wells completed in ancestral Sacramento River stream channel deposits yield up to 4000 gpm. Wells completed in the finer-grained portions of the older alluvium produce between 50 and 150 gpm.

The Tehama Formation is the thickest water-bearing unit underlying the Solano subbasin, ranging in thickness from 1500 to 2500 feet. Surface exposures of the Tehama Formation are limited mainly to the English Hills along the western margin of the basin. It consists of moderately compacted silt, clay, and silty fine sand enclosing lenses of sand and gravel, silt and gravel, and cemented conglomerate. Permeability of the Tehama Formation is variable, but generally less than the overlying younger units. Because of its relatively greater thickness, however, wells completed in the Tehama can yield up to several thousand gpm.

Underlying the Tehama Formation are brackish to saline water-bearing sedimentary units including the somewhat brackish sedimentary rocks of volcanic origin (Pliocene to Oligocene?) underlain by undifferentiated marine sedimentary rocks (Oligocene? to Paleocene). These units are typically of low permeability and contain connate water. The upper contact of these units generally coincides with the fresh/saline water boundary at depths as shallow as a few hundred feet near the Coast Range on the west to nearly 3000 feet near the eastern margin of the basin (Berkstresser and others 1973).

Groundwater Level Trends

Groundwater levels were measured at what we now consider to be natural, predevelopment levels in 1912 by the USGS. At that time the general direction of groundwater flow in this subbasin was from northwest to southeast. From 1912 to 1932, below-average precipitation resulted in lower groundwater levels throughout the basin. Due to above-average precipitation from 1932 and 1941 groundwater levels recovered slightly in spite of increased groundwater development. After 1941, groundwater levels continued to decline due to increasing agricultural and urban development, reaching their lowest historical levels in the late 1950s. A large pumping depression between Davis and Dixon was one of the more notable groundwater level depressions in the subbasin. Surface water deliveries from the Solano Project beginning in 1959 caused groundwater levels to rise slightly or slow their descent. Since this time, groundwater level trends within the Solano subbasin have been impacted by drought periods in the mid-1970s and late-1980s but have recovered quickly in the following "wet" years. (This discussion is taken largely from California Department of Water Resources, 1994.)

Groundwater Storage

Groundwater Storage Capacity. To date, there has been no groundwater storage calculation for the Solano subbasin as it is described by Bulletin 118. The USGS, however, has determined specific yield averages and groundwater storage calculations for some areas within and around the Solano subbasin (Thomasson and others 1960).

Groundwater in Storage. (see above)

Groundwater Budget (Type C)

Currently no groundwater budget has been calculated for the Solano Subbasin.

Groundwater Quality

Characterization. This discussion of groundwater quality is based on USGS Water Supply Investigation Report 84-4244 (Evenson, 1985) except where noted.

Groundwater within the Solano subbasin is considered to be of generally good quality, and useable for both domestic and agricultural purposes. Chemical water types within the basin are variable and classified generally as magnesium bicarbonate in the central and northern areas, sodium bicarbonate in the southern and eastern areas, and calcium magnesium or magnesium calcium bicarbonate around and west of Dixon. Total dissolved solids (TDS) range from between 250 and 500 ppm in the northwest and eastern portion of the basin and are found at levels higher than 500 ppm in the central and southern areas. (Evaluation of data from the Department of Health Services (Department of Health Services, 2000) shows the TDS minimum = 150 ppm, maximum = 880 ppm, average = 427 ppm). In general, most of the water within the subbasin is classified as hard to very hard (see below).

Chloride concentrations are found over 100 ppm in the southern areas, while sulfate concentration is greater than 50 ppm in the southern areas. The maximum contaminant level (MCL) for both chloride and sulfate is 600 ppm.) Boron concentrations are less than 0.75 ppm except in the southern and southeastern basin where concentrations average between 0.75 and 2.0 ppm (more than 1.0 ppm will affect sensitive tree crops).

Iron concentrations increase toward the eastern side of the subbasin, from less than 0.02 ppm to greater than 0.05 ppm (MCL = 0.3 ppm) along the Sacramento River, while manganese concentrations also increase from west to east with concentrations from .01 ppm to over 0.1 ppm (MCL = 0.050 ppm) found north of Rio Vista and east of the Solano-Yolo County line.

Impairments. Overall hardness (as $CaCO_3$) is generally greater than 180 ppm. Approximately one half of drinking water well samples taken between 1970 and 2000 analyzed for overall hardness measured above 200 ppm, but

rarely over 400 ppm (Department of Health Services 2000). High concentrations of bicarbonate which cause precipitation of Ca and Mg carbonates is found in the southern portion of the basin.

Arsenic concentrations are typically between 0.02 and 0.05 ppm, with the highest concentrations found along the southeastern margin of the basin. Although this is currently not considered problematic, there could be impacts if the MCL is lowered. The current MCL (as set by the EPA) for arsenic is 0.05 ppm. Also, manganese (a secondary constituent) is found at concentrations above the MCL of 0.05 ppm along the Sacramento River along the eastern portion of the subbasin.

Water Quality in Public Supply Wells

Constituent Group[1]	Number of wells sampled[2]	Number of wells with a concentration above an MCL[3]
Inorganics – Primary	71	1
Radiological	41	0
Nitrates	96	8
Pesticides	56	3
VOCs and SVOCs	57	1
Inorganics – Secondary	71	17

[1] A description of each member in the constituent groups and a generalized discussion of the relevance of these groups are included in *California's Groundwater – Bulletin 118* by DWR (2003).
[2] Represents distinct number of wells sampled as required under DHS Title 22 program from 1994 through 2000.
[3] Each well reported with a concentration above an MCL was confirmed with a second detection above an MCL. This information is intended as an indicator of the types of activities that cause contamination in a given basin. It represents the water quality at the sample location. It does not indicate the water quality delivered to the consumer. More detailed drinking water quality information can be obtained from the local water purveyor and its annual Consumer Confidence Report.

Well Characteristics

Well yields (gal/min)

Currently there is insufficient data to provide statistics on water well yields.

	Total depths (ft) [1]	
Domestic	Range: 38 to 1070 ft	Average: 239 ft
Municipal/Irrigation	Range: 62 to 2275 ft	Average: 510 ft

[1] Based on DWR well completion report data from 2001.

Active Monitoring Data

Agency	Parameter	Number of wells /measurement frequency
DWR	Groundwater levels	35 semi-annually 7 monthly
Solano ID		7 semi-annually 2 monthly
USBR		60 semi-annually 12 monthly
DWR	Miscellaneous water quality	23
Department of Health Services and cooperators	Title 22 water quality	136

Basin Management

Groundwater management:	City of Vacaville adopted AB3030 plan in 2/95 Maine Prairie Water District adopted AB3030 plan in 1/97 Reclamation District #2068 adopted AB3030 plan in 1/97 Solano Irrigation District adopted AB3030 plan in 2/95
Water agencies	
Public	City of Dixon City of Rio Vista California Water Service City of Vacaville University of California, Davis
Private	Maine Prairie Water District Solano Irrigation District Solano County Water Agency North Delta Water Agency Reclamation District #501 Reclamation District #536 Reclamation District #1607 Reclamation District #1667 Reclamation District #2060 Reclamation District #2068 Reclamation District #2084 Reclamation District #2093 Reclamation District #2098 Reclamation District #2104 Reclamation District #2112

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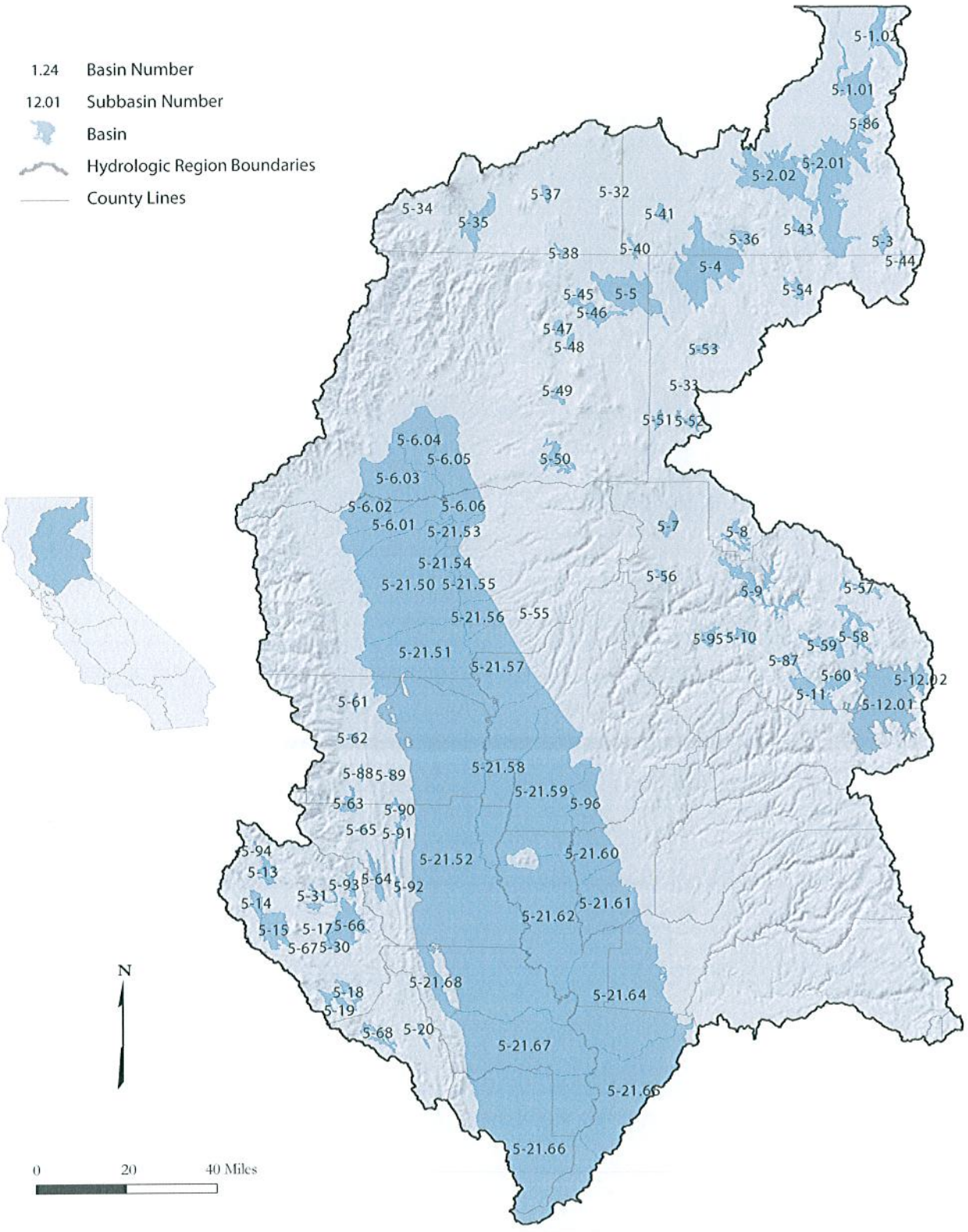
Errata

Changes made to the basin description will be noted here.



Sacramento River Hydrologic Region

APPENDIX C

- Antioch Pump Plano 3, California Period of Record Monthly Climate Summary
- N.O.A.A. California Precipitation Graph

ANTIOCH PUMP PLANT 3, CALIFORNIA (040232)

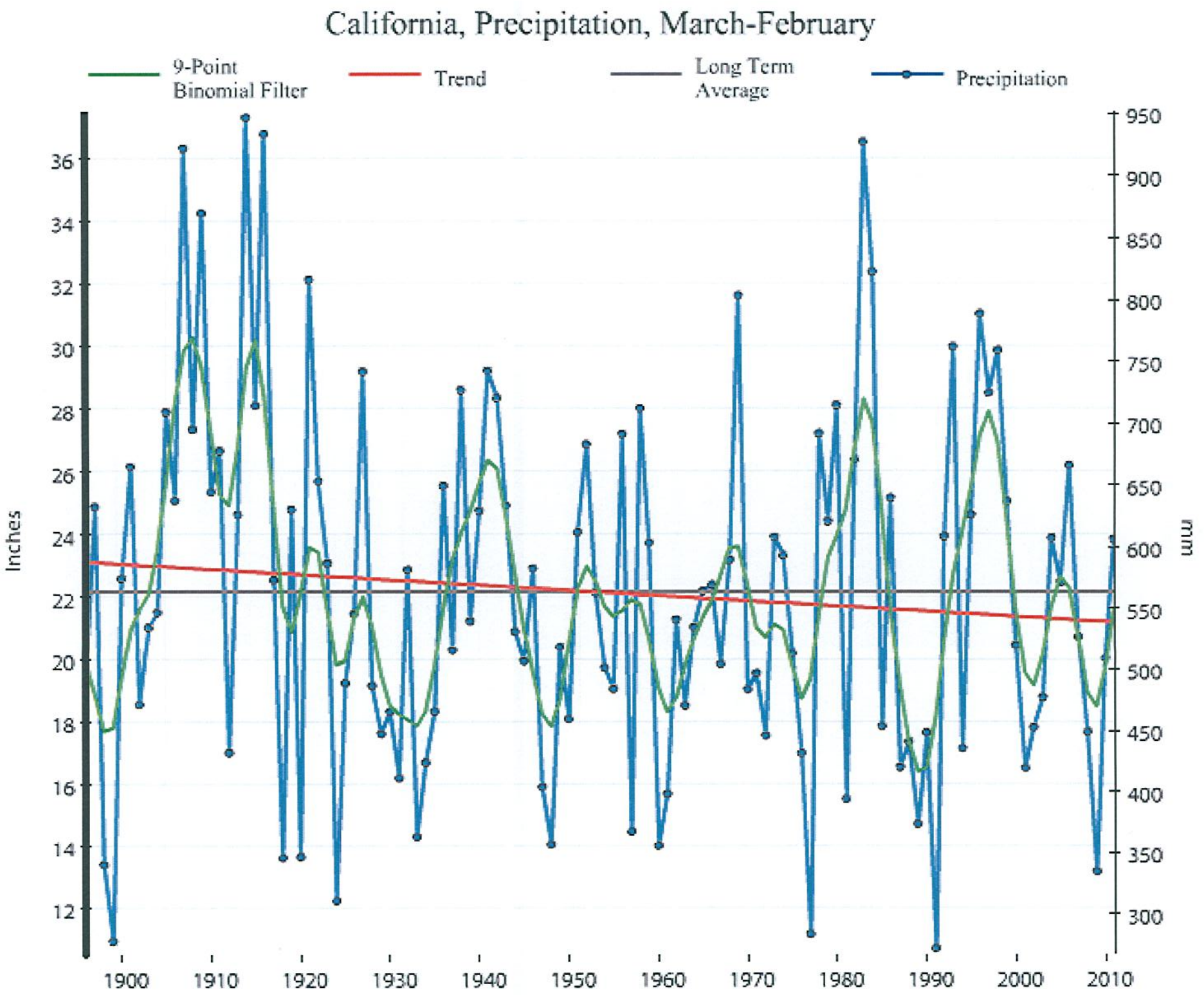
Period of Record Monthly Climate Summary

Period of Record : 3/ 1/1955 to 12/31/2005

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (F)	53.7	60.2	65.3	71.4	78.5	86.0	91.1	90.0	86.2	77.6	64.2	54.7	73.2
Average Min. Temperature (F)	37.1	40.9	43.3	46.2	51.2	56.0	57.3	56.7	55.1	50.1	42.8	37.3	47.8
Average Total Precipitation (in.)	2.79	2.41	1.96	0.88	0.39	0.10	0.02	0.05	0.20	0.68	1.65	2.22	13.34
Average Total SnowFall (in.)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Average Snow Depth (in.)	0	0	0	0	0	0	0	0	0	0	0	0	0

Percent of possible observations for period of record.
Max. Temp.: 98% Min. Temp.: 98.4% Precipitation: 98.8% Snowfall: 99.1% Snow Depth: 99.1%
Check Station Metadata or Metadata graphics for more detail about data completeness.

Western Regional Climate Center, wrcc@dri.edu

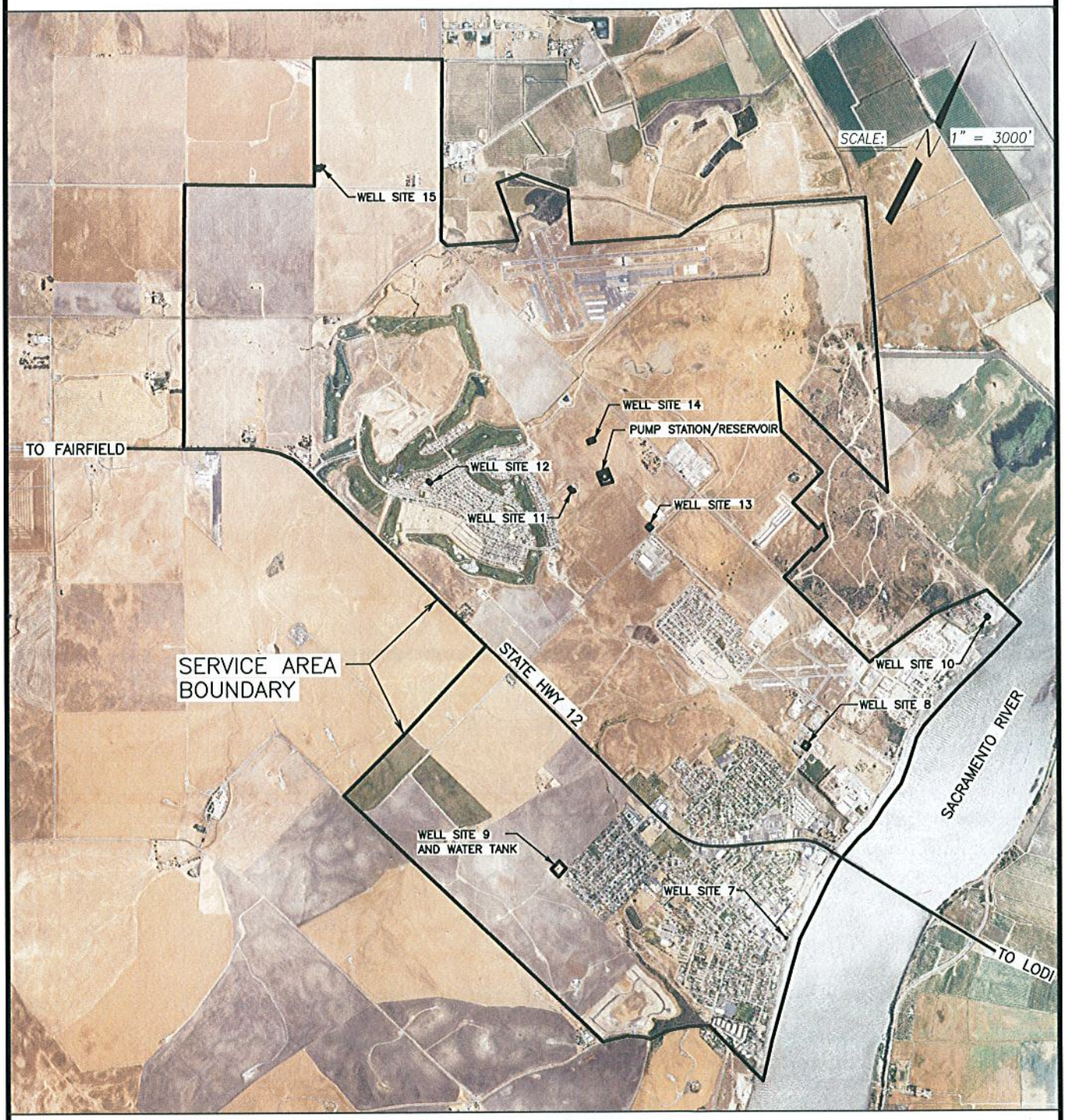

California, Precipitation, March-February
9-Point Binomial Filter
Trend
Long Term Average
Precipitation
Inches
mm
36
34
32
30
28
26
24
22
20
18
16
14
12
950
900
850
800
750
700
650
600
550
500
450
400
350
300
1900
1910
1920
1930
1940
1950
1960
1970
1980
1990
2000
2010

APPENDIX D

- Water Service Area Map
- Population Estimate (State of California Dept of Financing)
- Urban Water Supplier Gross Water Use Calculations

CITY OF RIO VISTA WATER SERVICE AREA

WATER SYSTEM NUMBER 4810004



R0808

Table 2: E-4 Population Estimates for Cities, Counties and State, 2001-2010
with 2000 Benchmark

COUNTY/CITY	4/1/2000	1/1/2001	1/1/2002	1/1/2003	1/1/2004	1/1/2005	1/1/2006	1/1/2007	1/1/2008	1/1/2009	1/1/2010
Fairfield	96,178	98,050	100,606	102,534	103,343	104,113	104,950	104,859	106,192	106,194	105,955
Rio Vista	4,571	4,774	5,368	5,674	6,276	6,797	7,332	7,802	8,048	8,203	8,324
Suisun City	26,118	26,523	26,805	26,954	27,430	27,553	27,583	27,831	28,043	28,785	28,962
Vacaville	88,642	90,770	92,802	94,215	95,121	96,222	95,879	96,025	96,441	96,235	97,305
Vallejo	117,148	118,380	119,753	120,485	121,148	120,522	120,394	120,790	120,466	120,765	121,435
Balance Of County	19,305	19,546	19,737	19,736	19,759	19,556	19,948	20,021	20,079	20,111	20,165
Incorporated	375,625	381,862	388,776	393,212	396,658	399,448	400,767	402,625	404,506	405,629	407,672
County Total	394,930	401,408	408,513	412,948	416,417	419,004	420,715	422,646	424,585	425,740	427,837
Sonoma County											
Cloverdale	6,831	7,088	7,340	7,489	7,965	8,205	8,415	8,432	8,512	8,569	8,636
Cotati	6,471	6,497	6,701	6,736	6,926	7,185	7,230	7,375	7,388	7,418	7,476
Healdsburg	10,915	11,388	11,650	11,628	11,639	11,661	11,651	11,641	11,668	11,800	11,931
Petaluma	54,550	55,483	55,775	55,858	56,091	56,381	56,479	56,688	57,241	57,817	58,401
Rohnert Park	42,236	42,309	42,233	42,455	42,282	42,262	42,833	42,722	42,922	43,081	43,398
Santa Rosa	147,595	149,648	152,053	154,027	154,944	155,589	156,431	157,126	159,469	161,716	163,436
Sebastopol	7,774	7,805	7,814	7,789	7,768	7,760	7,718	7,716	7,687	7,745	7,943
Sonoma	9,275	9,507	9,483	9,580	9,721	9,792	9,847	9,887	9,911	9,984	10,078
Windsor	22,744	23,553	24,130	24,425	24,867	25,359	25,889	26,280	26,471	26,714	26,955
Balance Of County	150,223	151,277	151,310	150,898	151,476	151,509	150,428	151,068	151,452	152,415	155,031
Incorporated	308,391	313,278	317,179	319,987	322,203	324,194	326,493	327,867	331,269	334,844	338,254
County Total	458,614	464,555	468,489	470,885	473,679	475,703	476,921	478,935	482,721	487,259	493,285
Stanislaus County											
Ceres	34,609	35,111	35,805	36,519	37,473	38,712	40,719	41,678	42,491	42,888	43,219
Hughson	3,980	4,124	4,249	4,934	5,249	5,926	6,090	6,036	6,138	6,175	6,240
Modesto	188,861	193,672	199,455	203,892	206,934	207,101	206,991	207,613	208,375	209,574	211,536
Newman	7,092	7,504	7,569	7,786	8,342	9,111	10,086	10,227	10,507	10,716	10,824
Oakdale	15,503	15,760	16,284	16,777	17,179	17,393	17,759	18,488	19,192	19,558	19,854
Patterson	11,606	12,224	13,081	13,711	14,222	16,123	19,170	20,727	21,078	21,116	21,251
Riverbank	15,826	16,194	17,074	17,312	18,264	19,935	21,100	21,330	21,595	21,753	22,201
Turlock	55,811	58,396	60,492	62,373	64,443	66,841	67,518	68,813	69,650	70,087	71,181
Waterford	6,924	7,039	7,196	7,694	7,885	7,877	8,171	8,525	8,697	8,793	8,860
Balance Of County	106,785	108,569	111,121	112,902	113,715	114,172	114,001	114,174	114,281	114,430	115,418
Incorporated	340,212	350,024	361,205	370,998	379,991	389,019	397,604	403,437	407,723	410,660	415,166
County Total	446,997	458,593	472,326	483,900	493,706	503,191	511,605	517,611	522,004	525,090	530,584
Sutter County											
Live Oak	6,229	6,331	6,400	6,464	6,580	6,739	7,431	8,071	8,452	8,571	8,791
Yuba City	36,758	45,598	46,846	48,504	50,987	57,959	60,146	61,650	62,671	63,647	65,372
Balance Of County	35,943	28,248	28,617	29,119	28,896	24,136	23,835	24,058	24,267	24,337	24,991
Incorporated	42,987	51,929	53,246	54,968	57,567	64,698	67,577	69,721	71,123	72,218	74,163
County Total	78,930	80,177	81,863	84,087	86,463	88,834	91,412	93,779	95,390	96,555	99,154

URBAN RETAIL WATER SUPPLIER GROSS WATER USE CALCULATION

Utility Name:		12-month period			1-Jan to 31-Dec			Volume Units:			AF
		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Item	Calculation	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
	Volume from Own Sources (raw data)	1620	1645	1872	2154	2277	2197	2489	2934	3115	2467
	Meter error adjustment (+/-)	32	33	37	43	46	44	50	59	62	49
1	*Subtotal:* Corrected Volume from Own Sources	1652	1678	1909	2197	2323	2241	2539	2993	3177	2516
	Volume from Imported Sources (raw data)	0	0	0	0	0	0	0	0	0	0
	Meter error ajdustment (+/-)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2	*Subtotal:* Corrected Volume from Imported Sources	0	0	0	0	0	0	0	0	0	0
3	***Total Volume Into Dist. System - Item 1 + Item 2***	1652	1678	1909	2197	2323	2241	2539	2993	3177	2516
	Volume Exported to Other Utilities (raw data)	0	0	0	0	0	0	0	0	0	0
	Meter error adjustment (+/-)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
4	*Subtotal:* Corrected Volume Exported to Other *Utilities*	0	0	0	0	0	0	0	0	0	0
5	Change in Dist. System Storage (+/-)	0	0	0	0	0	0	0	0	0	0
6	***Gross Water Use Before Indirect Recycled Water Use Deductions = Item 3 - Item 4 - Item 5***	1652	1678	1909	2197	2323	2241	2539	2993	3177	2516
7	Indirect Recycled Water Use Deduction	0	0	0	0	0	0	0	0	0	0
8	***Gross Water Use Before Indirect Recycled Water Use Deductions = Item 6 - Item 7***	1652	1678	1909	2197	2323	2241	2539	2993	3177	2516
9	*Water Delivered for Ag. Use (optional deduction)*										
10	*Process Water Use (Optional deduction)*										
11	**Gross Water Use Before Indirect Recycled Water Use Deductions = Item 8 - Item 9, Item 10**	1652	1678	1909	2197	2323	2241	2539	2993	3177	2516

APPENDIX E

- Tables 1 - 38

Table 1
Coordination with appropriate agencies

Coordinating Agencies	Participated in developing the plan	Commented on the draft	Attended public meetings	Was contacted for assistance	Was sent a copy of the draft plan	Was sent a notice of intention to adopt	Not involved / No information
Solano County				X			
Solano Co. Water Agency				X			
Veolia Re: Sewer Treatment		X		X	X		
Public	X	X	X			X	
Other							

Table 2 Population - current and projected							
	2010	2015	2020	2025	2030	2035-optional	Data source[2]
Service area population[1]	8,324 [4]	10,112 [3]	11,900 [3]	13,250 [3]	14,600 [3]		See Below

[1] Service area population is defined as the population served by the distribution system. See Technical Methodology 2: Service Area Population (2010 UWMP Guidebook, Section M).

[2] Provide the source of the population data provided.

Data from:

[3]Assoc. Of Bay Area Gov't

[4]State of Calif. Dept. of Finance

Table 3 Water deliveries - actual, 2005					
	2005				
	Metered		Not metered		Total
Water use sectors	# of accounts	Volume	#of Accounts	Volume	Volume
Single family					
Multi-family	NDA	0	NDA	2,047	2,047
Commercial	NDA	118	NDA	0	118
Industrial	NDA	68	NDA	0	68
Institutional/governmental	NDA	0	NDA	2	2
Landscape	NDA	0	NDA	0	0
Agriculture	NDA	0	NDA	0	0
Other Churches	NDA	0	NDA	6	6
Total	NDA	186	NDA	2,055	2,241
Units (circle one):	acre-feet per year	million gallons per year	cubic feet per year		

NDA = No Data Available

Table 4 Water deliveries - actual, 2010					
	2010				
	Metered		Not metered		Total
Water use sectors	# of accounts	Deliveries AFY	#of Accounts	Deliveries AFY	Volume
Single family					
Multi-family	0	0	3,717	2,217	2,217
Commercial	207	123	0	0	123
Industrial	119	71	0	0	71
Institutional/governmental	0	0	3	2	2
Landscape	0	0	0	0	0
Agriculture	0	0	0	0	0
Other	0	0	9	6	6
Total	326	194	3,729	2,225	2,419
Units (circle one):	acre-feet per year	million gallons per year	cubic feet per year		

Table 5 Water deliveries - projected, 2015					
	2015				
	Metered		Not metered		Total
Water use sectors	# of accounts	Deliveries AFY	# of accounts	Deliveries AFY	Volume
Single family					
Multi-family	4,515	2,681	0	0	2,681
Commercial	252	142	0	0	142
Industrial	144	85	0	0	85
Institutional/governmental	4	2	0	0	2
Landscape	0	0	0	0	0
Agriculture	0	0	0	0	0
Other	11	6	0	0	6
Total	4,926	2,916	0	0	2,916
Units (circle one):	acre-feet per year	million gallons per year		cubic feet per year	

Table 6
Water deliveries - projected , 2020

	2020				
	Metered		Not metered		Total
Water use sectors	# of accounts	Deliveries AFY	# of accounts	Deliveries AFY	Volume
Single family	5,313	3,126	0	0	3,126
Multi-family					
Commercial	296	174	0	0	174
Industrial	170	100	0	0	100
Institutional/governmental	5	3	0	0	3
Landscape	0	0	0	0	0
Agriculture	0	0	0	0	0
Other	13	9	0	0	9
Total	5,797	3,412	0	0	3,412

Units (circle one): acre-feet per year million gallons per year cubic feet per year

Table 7 Water deliveries - projected 2025, 2030, and 2035						
	2025		2030		2035- optional	
	metered		metered		metered	
Water use sectors	# of accounts	Deliveries AFY	# of accounts	Deliveries AFY	# of accounts	Deliveries AFY
Single family						
Multi-family	5,917	4,351	6,520	5,443		
Commercial	329	242	363	302		
Industrial	189	139	208	174		
Institutional/governmental	5	4	6	5		
Landscape	0	0	0	0		
Agriculture	0	0	0	0		
Other	15	11	16	14		
Total	6,455	4,747	7,113	5,938		
Units (circle one):	acre-feet per year	million gallons per year	cubic feet per year			

Table 8 Low-income projected water demands					
	2015	2020	2025	2030	2035-opt
	metered		metered		metered
Low-income Water Demands[1]	# of accounts	Deliveries AFY	# of accounts	Deliveries AFY	# of accounts
Single family	NDA	NDA	NDA	NDA	
Multi-family	NDA	NDA	NDA	NDA	
Total					
Units (circle one): acre-feet per year million gallons per year cubic feet per year					
[1] *Provide demands either as directly estimated values or as a percent of demand.*					

NDA = No Data Available

Table 9 Sales to other water agencies								
Water distributed		2005	2010	2015	2020	2025	2030	2035-opt
Name of Agency								
Name of Agency								
Name of Agency								
	Total							
Units (circle one): acre-feet per year million gallons per year cubic feet per year								

NOTE: Rio Vista is not a wholesale Water Distributor and does not plan to undertake a role in wholesale distribution.

Table 10 Additional water uses and losses								
Water use		2005	2010	2015	2020	2025	2030	2035-opt
Saline barriers	N/A	0	0	0	0	0	0	
Groundwater recharge	N/A	0	0	0	0	0	0	
Conjunctive use	N/A	0	0	0	0	0	0	
Raw Water	N/A	0	0	0	0	0	0	
Recycled Water	N/A	0	0	0	0	0	0	
System losses	N/A	0	0	0	0	0	0	
Other (define)	N/A	0	0	0	0	0	0	
Total								
Units (circle one): acre-feet per year million gallons per year cubic feet per year								

Note: *Any water accounted for in Tables 3 through 7 are not included in this table.*

Table 11 Total water use							
Water use	2005	2010	2015	2020	2025	2030	2035-opt
Total water use deliveries (from Tables 3 to 7)	2,241	2,419	2,916	3,412	4,747	5,938	
Sales to other water agencies (from Table 9)	0	0	0	0	0	0	
Additional water uses and losses (from Table 10)	0	0	0	0	0	0	
Total	2,241	2,419	3,028	3,791	4,747	5,938	
Units (circle one): *acre-feet per year* *million gallons per year* *cubic feet per year*							

Table 12 Retail agency demand projections provided to wholesale suppliers							
Wholesaler	Contracted Volume	2010	2015	2020	2025	2030	2035-opt
None	0	0	0	0	0	0	

City of Rio Vista doe not import/export water

Table 13 Based period ranges			
Base	**Parameter**	**Value**	**Units**
10-to 15-year base period	**2008 total water deliveries**	3,177	see below
	2008 total volume of delivered recycled water	0	see below
	2008 recycled water as a percent of total deliveries	0	percent
	Number of years in base period[1]	10	years
	Year beginning base period range	2000	
	Year ending base period range	2009	
5-year base period	Number of years in base period	5	years
	Year beginning base period range	2005	
	Year ending base period range	2009	

Units (circle one): *acre-feet per year* *million gallons per year* *cubic feet per year*

[1] If the 2008 recycled water percent is less than 10 percent, then the first base period is a continuous 10-year period. If the amount of recycled water delivered in 2008 is 10 percent greater, the first base period is a continuous 10- to 15-year period.

[2] The ending year must be between December 31, 2004 and December 31, 2010.

[3] The ending year must be between December 31, 2007 and December 31, 2010.

Table 14 Base daily per capita water use - 10 - to 15-year period				
Base period year		Distribution System Population	Daily system gross water use (mgd)	Annual daily per capita water use (gpcd)
Sequence Year	Calendar Year			
Year 1	2000	4,571	1.47	323
Year 2	2001	4,774	1.50	314
Year 3	2002	5,368	1.70	317
Year 4	2003	5,674	1.96	346
Year 5	2004	6,276	2.07	330
Year 6	2005	6,797	2.00	294
Year 7	2006	7,332	2.27	309
Year 8	2007	7,802	2.67	342
Year 9	2008	8,048	2.84	352
Year 10	2009	8,203	2.25	274
Year 11				
Year 12				
Year 13				
Year 14				
Year 15				
			Base Daily Per Capita Water Use[1]	320

Units (circle one): *acre-feet per year* *millions gallons per year* *cubic feet per year*

[1] *Add the values in the column and divide by the number of rows.*

Table 15
Base daily per capita water use -- 5 year range

Base period year		Distribution System Population	Daily system gross water use (mgd)	Annual daily per capita water use (gpcd)
Sequence Year	Calendar Year			
Year 1	2005	6797	2.00	294
Year 2	2006	7332	2.27	309
Year 3	2007	7802	2.67	342
Year 4	2008	8048	2.84	353
Year 5	2009	8203	2.25	274
			Base Daily Per Capita Water Use[1]	314

Units (circle one): *acre-feet per year* *million gallons per year* *cubic feet per year*

[1] *Add the values in the column and divide by the number of rows.*

Table 16
Water supplies - current and projected

Water Supply Sources		2010	2015	2020	2025	2030	2035-opt
Water purchased from[1]	Wholesaler supplied volume (yes/**no**)						
Wholesaler 1 (enter agency name)	No	0	0	0	0	0	
Wholesaler 2 (enter agency name)	No	0	0	0	0	0	
Wholesaler 3 (enter agency name)	No	0	0	0	0	0	
Supplier-produced groundwater[2]		2,419	2,916	3,412	4,747	5,938	
Supplier-produced surface water		0	0	0	0	0	
Transfers in		0	0	0	0	0	
Exchanges in		0	0	0	0	0	
Recycled Water		0	0	0	0	0	
Desalinated Water		0	0	0	0	0	
Other	N/A	0	0	0	0	0	
Other	N/A	0	0	0	0	0	
Total		2,419	2,916	3,412	4,747	5,938	

Units (circle one) *acre-feet per year* *million gallons per year* *cubic feet per year*

[1] *Volumes shown here should be what was purchased in 2010 and what is anticipated to be purchased in the future. If these numbers differ from what is contracted, show the contracted quantities in Table 17.*

[2] Volumes shown here should be consistent with Tables 17 and 18.

Table 17 Wholesale supplies - existing and planned sources of water						
Wholesale sources[1, 2]	Contracted Volume[3]	2015	2020	2025	2030	2035 - opt
(Source 1) N/A						

Units (circle one): acre-feet per year million gallons per year cubic feet per year

[1] *Water volumes presented here should be accounted for in Table 16.*

[2] *If the water supplier is a wholesaler, indicate all customers (excluding individual retail customers) to which water is sold. If the water supplier is a retailer, indicate each wholesale supplier.*

[3] *Indicate the full amount of water. N/A*

NOTE: Rio Vista does not purchase water and does not aniticipate doing so.

Table 18 Groundwater -- volume pumped						
Basin name(s)	Metered or Unmetered	2006	2007	2008	2009	2010
Sacramento Valley	Metered	2,539	2,993	3,177	2,516	2,419
Groundwater as a percent of total water supply		100%	100%	100%	100%	100%
Units (circle one):	acre-feet per year	*million gallons per year*	*cubic feet per year*			
[1] *Indicate whether volume is based on volumetric meter data of another method.*						

All volumes based on Volumetric data.

Table 19 Groundwater -- volume projected to be pumped					
Basin name(s)	2015	2020	2025	2030	2035-opt
Sacramento Valley-Solano Subbasin	2,916	3,412	4,747	5,938	
Percent of total water supply	100%	100%	100%	100%	

Table 20
Transfer and exchange opportunities

Transfer agency	Transfer or exchange	Short term or long term	Proposed Volume
Solano Co. Water Agency	Transfer	Short	1,500
Total			1,500

Units (circle one):	*acre-feet per year*	*million gallons per year*	*cubic feet per year*

BEACH WWTP

Table 21 Recycled water -- wastewater collection and treatment							
Type of Wastewater	2005	2010	2015	2020	2025	2030	2035-opt
Wastewater collected & treated in service area	158.775	164.615	182.5				
Volume that meets recycled water standard	0	0	0				
Units (circle one): *acre-feet per year*	*million gallons per year*	*cubic feet per year*					

NOTE:

plant effluent does not meet recycle water standards and there is no infrastructure available to provide the water for recycle.

NORTHWEST WWTP

Table 21 Recycled water -- wastewater collection and treatment							
Type of Wastewater	2005	2010	2015	2020	2025	2030	2035-opt
Wastewater collected & treated in service area	63.875	70.81	80.3				
Volume that meets recycled water standard	0	0	0				
Units (circle one): *acre-feet per year*	*million gallons per year*	*cubic feet per year*					

NOTE: plant effluent meets recycle water standard but the level of redundancy in processes does not, and there is limited insfrastructure available to provide recycled water for use.

Table 22 Recycled water -- non-recycled wastewater disposal							
Method of disposal	**Treatment Level**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035-opt**
Pumped to River		722.4	NDA	NDA	NDA	NDA	
Total		722.4					
Units (circle one):	*acre-feet per year*	*million gallons per year*	*cubic feet per year*				

NDA = No Data Available

Table 23
Recycled water -- potential future use

User type	Description	Feasibility[1]	2015	2020	2025	2030	2035-opt
Agricultural irrigation							
Landscape irrigation[2]							
Commercial irrigation[3]							
Golf course irrigation	**Trilogy Golf Course**			**614.9**			
Wildlife habitat							
Wetlands							
Industrial reuse							
Groundwater recharge							
Seawater barrier							
Geotothermal/Energy							
Indirect potable reuse							
Other (user type)							
Other (user type)							
Total				614.9			

Units (circle one): acre-feet per year million gallons per year cubic feet per year

[1] *Technical and economic feasibility.*

[2] *Includes parks, schools, cemeteries, churches, residential, or other public facilities*

[3] *Includes commercial building use such as landscaping, toilets, HVAC, etc. and commercial uses (car washes, laundries, nurseries, etc.)*

Table 24 Recycled water -- 2005 UWMP use projection compared to 2010 actual		
User type	**2010 actual use**	**2005 Projection for 2010[1]**
Agricultural irrigation	0	0
Landscape irrigation[2]	0	0
Commercial irrigation[3]	0	0
Golf course irrigation	0	0
Wildlife habitat	0	0
Wetlands	0	0
Industrial reuse	0	0
Groundwater recharge	0	0
Seawater barrier	0	0
Geotothermal/Energy	0	0
Indirect potable reuse	0	0
Other (user type)	0	0
Other (user type)	0	0
Total	0	0

Units (circle one): acre-feet per year million gallons per year cubic feet per year

[1] *From the 2005 UWMP. There has been some modification of use types. Data from the 2005 UWMP can be left in the existing categories or modified to the new categories, at the discretion of the water supplier.*

[2] *Includes parks, schools, cemeteries, churches, residential, or other public facilities.*

[3] *Includes commercial building use such as landscaping, toilets, HVAC, etc. and commercial uses (car washes, laundries, nurseries, etc.)*

NOTE: Recycled water was not used in 2005 nor 2010. Usage of recycled water is not anticipated due to cost prohibitions.

Table 25 Methods to encourage recycled water use						
Actions	Projects Results					
	2010	2015	2020	2025	2030	2035-opt
Financial incentives						
Name of action						
Name of action						
Total						
Units (circle one): acre-feet per year million gallons per year cubic feet per year						

Table 26
Future water supply projects

Project name[1]	Project start date	Projected completion date	Potential project constraints[2]	Normal-year supply[3]	Single-dry year supply[3]	Multiple-dry year first year supply[3]	Multiple-dry year second year supply[3]	Multiple-dry year third year supply[3]
Additional Wells	unknown	unknown	dependant on development					

Units (circle one): acre-feet per year million gallons per year cubic feet per year

[1] *Water volumes presented here should be accounted for in Table 16.*

[2] *Indicate whether project is likely to happen and what constraints, if any, exist for project implementation.*

[3] *Provide estimated supply benefits, if available.*

No future water project anticipated at this time.

Table 27 Basis of water year data	
Water Year Type	**Base Year(s)**
Average Water Year	2002
Single-Dry Year	2003
Multiple-Dry Water Years	2007-2008

Table 28 Supply reliability - historic conditions					
		Multiple Dry Water Years			
Average / Normal Water Year	**Single Dry Year**	**Year 1**	**Year 2**	**Year 3**	**Year 4**
317 GPCD (2002)	346 GPCD (2003)	342 GPCD (2007)	352 GPCD (2008)		
Percent of Average/Normal Year:	1.09%	1.07%	1.11%		

Table 29
Factors resulting in inconsistency of supply

Water supply sources[1]	Specific source name, if any	Limitation quantification	Legal	Environmental	Water quality	Climatic	Additional information
Solano Subbasin	Solano	Unknown			X		Arsenic

Units (circle one): acre-feet per year million gallons per year cubic feet per year

[1] *From Table 16.*

Table 30 Water quality - current and projected water supply impacts							
Water source	**Description of condition**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035 - opt**
Well #10	**Currently in design for filtration**	**No Data**	**No Impact**				
Units (circle one):	*acre-feet per year*	*million gallons per year*	*cubic feet per year*				

Table 31 Supply reliability - current water sources				
Water supply sources[1]	**Average / Normal Water Year Supply[2]**	**Multiple Dry Water Year Supply[2]**		
		Year 2011	**Year 2012**	**Year 2013**
Supplier Produced Groundwater	2,372	3,365	3,519	3,681
Percent of normal year:	100%	133%	133%	133%

Units (circle one): *acre-feet per year* *million gallons per year* *cubic feet per year*

[1] *From Table 16.*

[2] *See Table 27 for basis of water type years.*

Table 32 Supply and demand comparison - normal year					
	2015	2020	2025	2030	2035 - opt
Supply totals (From Table 16)	3,028	3,791	4,747	5,938	
Demand totals (From Table 11)	3,028	3,791	4,747	5,938	
Difference	0	0	0	0	
Difference as % of Supply	100%	100%	100%	100%	
Difference as % of Demand	100%	100%	100%	100%	
Units are in acre-feet per year.					

Table 33 Supply and demand comparison - single dry year					
	2015	2020	2025	2030 - opt	2035
Supply totals[1]	2,916	3,412	4,747		
Demand totals[2,3,4]	3,178	3,719	5,174		
Difference	262	307	427		
Difference as % of Supply	9%	9%	9%		
Difference as % of Demand	8%	8%	8%		
Units are in acre-feet per year.					

[1] *Consider the same sources as in Table 16. If new sources of water are planed, add a column to the table and specify the source, timing, and amount of water.*

[2] *Provide in the text of the UWMP text that discusses how single-dry year water supply volumes were determined.*

[3] *Consider the same demands as in Table 3. If new water demands are anticipated, add a column to the table and specify the source, timing, and amount of water.*

[4] *The urban water target determined in this UWMP will be considered when developing the 2020 water demands included in this table.*

Table 34 Supply and demand comparison - multiple dry-year events						
		2015	2020	2025	2030	2035 - opt
Multiple-dry year first year supply	Supply totals[1,2]	2,916	3,412	4,747		
	Demand totals[2,3,4]	3,120	3,651	5,079		
	Difference	204	239	332		
	Differences as % of Supply	7%	7%	7%		
	Differences as % of Demand	7%	7%	7%		
Multiple-dry year second year supply	Supply totals[1,2]	3,015	3,679	5,014		
	Demand totals[2,3,4]	3,447	3,937	5,566		
	Difference	327	258	552		
	Differences as % of Supply	11%	7%	11%		
	Differences as % of Demand	9%	7%	10%		
Multiple-dry year third year supply	Supply totals[1,2]					
	Demand totals[2,3,4]					
	Difference					
	Differences as % of Supply					
	Differences as % of Demand					

Units are in acre-feet per year.

[1] *Consider the same sources as in Table 16. If new sources of water are planed, add a column to the table and specify the source, timing, and amount of water.*

[2] *Provide in the text of the UWMP text that discusses how single-dry year water supply volumes were determined.*

[3] *Consider the same demands as in Table 3. If new water demands are anticipated, add a column to the table and specify the source, timing, and amount of water.*

[4] *The urban water target determined in this UWMP will be considered when developing the 2020 water demands included in this table.*

Table 35 Water shortage contingency -- rationing stages to address water supply shortages		
Stage No.	**Water Supply Conditions**	**% Shortage**

[1] *One of the stages of action must be designed to address a 50 percent reduction in water supply.*

Note: City of Rio Vista does not have a water shortage contingency plan.

Table 36 Water shortage contingency -- mandatory prohibitions	
Examples of Prohibitions	**Stage When**
Using potable water for street washing	
Reduced Irrigation at parks, schools, and landscape areas	
Water use restriction days	
Other (name prohibition)	
Other (name prohibition)	
Other (name prohibition)	
Other (name prohibition)	

Table 37 Water shortage contingency -- consumption reduction methods		
Consumption	Stage When	Projected
Name method		
Name method		
Name method		
Name method		
Name method		
Name method		
Name method		

Table 38 Water shortage contingency -- penalties and charges	
Penalties or Charges	Stage When Penalty Takes Effect
Penalty for excess use	
Charge for excess use	
Other (name penalties or charges)	
Other (name penalties or charges)	
Other (name penalties or charges)	
Other (name penalties or charges)	
Other (name penalties or charges)	
Other (name penalties or charges)	
Other (name penalties or charges)	