

Water Sources

Historically, RLECWD has relied exclusively on groundwater from under its service area. Currently there are no viable interconnections with its neighboring water suppliers that are sufficient to service the district, nor other sources of potable, reclaimed or untreated water.

Surface Water

The creation of the Water Forum Agreement (WFA), to which RLECWD is a signatory, has considerably changed the vision of water supply operations in the Sacramento, Placer and El Dorado County region. Instead of isolated, independent operations by different water suppliers, the WFA establishes a cooperative framework to preserve the future surface water and ground water supplies.

The WFA has two co-equal objectives:

- Provide a reliable and safe water supply for the region's economic health and planned development to the year 2030; and
- Preserve the fishery, wildlife, recreational and aesthetic values of the Lower American River.

A comprehensive set of seven linked elements describe responsibilities and approaches to achieve the WFA goals. Element number one is “Increased Surface Water Diversions” to meet the region’s growing population and economy through the year 2030. All WFA signatories endorse all entitlements and facilities needed to divert, treat and distribute the water. RLECWD has no surface water rights. The WFA does not acknowledge any future water diversion structure being operated by RLECWD. The WFA does project the year 2030 ground water supply for RLECWD to be 17,035 AFPY.

The WFA does acknowledge other purveyors’ rights to surface water that may potentially be routed to RLECWD. Sacramento Suburban Water District (SSWD) may divert up to 29,000 acre feet of Placer County Water Agency (PCWA) water when unimpaired inflow to Folsom Reservoir is greater than 1.6 MAF. A portion of the 29,000 acre feet surface water contracted to SSWD may be allocated to RLECWD through contract. The amount of water and the conditions when it will be delivered are currently being discussed by RLECWD and SSWD. These negotiations are likely to continue into 2006.

Element number Two of the WFA is entitled “Action to Meet Customers’ Needs While Reducing Diversion Impacts in Drier Years.” The element stipulates that water purveyors will reduce their diversions from the Lower American River during drier years. The element also lists actions that water purveyors can use to meet customers’ needs in drier and driest years: conjunctive use of groundwater basins consistent with the sustainable yield objectives; utilizing other surface water resources; reservoir reoperation; increased conservation during drier and driest years; and wastewater reclamation (reuse).

Three of these actions pertain to RLECWD. Discussed in this UWMP, they are:

- Conjunctive use of groundwater basins consistent with the sustainable yield objectives;
- Increased conservation during drier and driest years; and

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- Wastewater reuse.

Element number Five is “Water Conservation.” Demand Management Measures (DMM), often called Best Management Practices for Urban Water Conservation (BMPs), are discussed extensively in Chapter 7 of this UWMP.

The WFA requires stakeholders to support a new diversion from the Sacramento River in northern Sacramento County. When the diversion and associated transmission facilities are available, RLECWD may have an opportunity to obtain surface water from the Sacramento River.

Table 4 - Current and Planned Water Supplies - acre feet per year

Name of Water Sources	2005	2010	2015	2020	2025	2030
Wholesale Purchases: Sacramento Suburban WD	none	1500	3000	5000	5000	5000
(1) Rio Linda Produced Groundwater	3,400	4,160	6,550	9,790	14,910	20,000
Rio Linda Surface Water	none	none	none	none	none	none
Diversions	none	none	none	none	none	none
Transfers in and out	none	none	none	none	none	none
Exchanges in and out	none	none	none	none	none	none
Recycled Water current and projected (2, 3)	none	1,500	2,000	2,500	2,500	2,500
Desalination	none	none	none	none	none	none
Other	none	none	none	none	none	none

- (1) Currently being negotiated - RLECWD would obtain up to 5,000 AFPY of Sacramento Suburban WD’s 29,000 AF purchase of PCWA surface water.
- (2) Cherry Island Golf course and Gibson Ranch Park are adjacent to the RLECWD service area and currently self-supplied with groundwater from the same basin as RLECWD. Under consideration is a scheme to supply the golf course with treated recycled wastewater from the City of Roseville. This would reduce the withdrawals from groundwater by up to 2000 AFPY. Refer to Chapter 9, Recycled Water.
- (3) Potential recycled water from SRCSD wastewater treatment facility in Northern Sacramento County after 2020.

Groundwater Pumping Rights

The North American Subbasin is not adjudicated. The right to pump water is an overlying right of the landowner to take water from the basin underneath the land for reasonable beneficial purposes on the land. There is no order or decree adjudicating the amount of water that RLECWD may pump to serve its customers.

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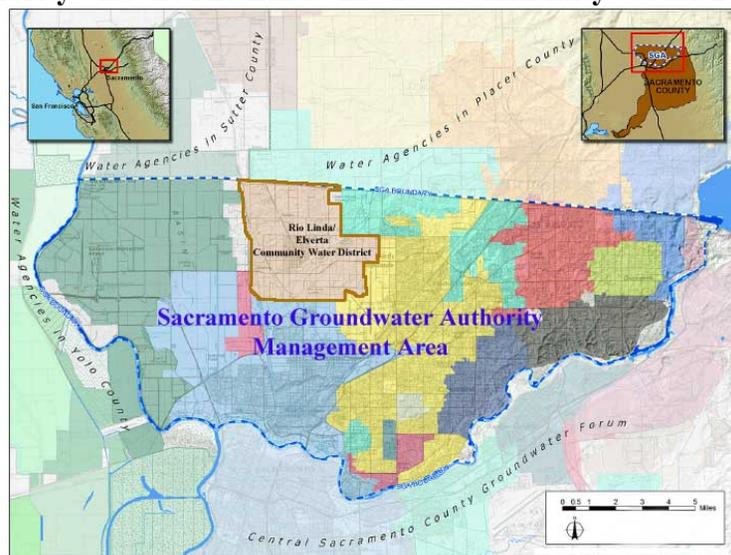
Groundwater Management Plan

WFA element number six is Groundwater Management. The element states: “the purpose of a groundwater management plan is to protect the viability of that resource for both current and future users. To do so requires monitoring the amount of water withdrawn from the groundwater basin, and promoting the use of groundwater in conjunction with surface water supplies to maximize the availability of both.” Conjunctive use is the planned management and use of both groundwater and surface water in order to improve the overall reliability of a region’s total water supply. For example, in wet years when surface water is plentiful, groundwater pumping may be reduced or eliminated and only surface water used. The groundwater basin would be replenished in these wet years. In dry years, when surface water is in short supply, the water that has been accumulating in the groundwater basin would be pumped for use and surface water diversions reduced or eliminated.

RLECWD is recognized as one of the water purveyors utilizing groundwater in the North Area. The WFA estimates 131,000 acre feet as the average annual sustainable yield of the North Area groundwater basin (Sacramento County north of the American River including the Sacramento International Airport).

To provide groundwater management, the WFA recommended that a Sacramento North Area Groundwater Management Authority be created by a joint powers agreement among public agencies which have the authority to manage groundwater. In 1998, this recommendation was fulfilled with the formation of the Sacramento Groundwater Authority (SGA). A joint powers agreement has been signed by the City of Sacramento, Sacramento County, City of Folsom, and City of Citrus Heights to exercise their common police powers to manage the underlying groundwater basin. These agencies manage the basin in a cooperative fashion with the local water purveyors, including RLECWD.

Figure 3 Map of Groundwater Basin including the Sacramento Groundwater Authority and the Rio Linda/Elverta Community Water District



Map from SGA GMP Figure 1

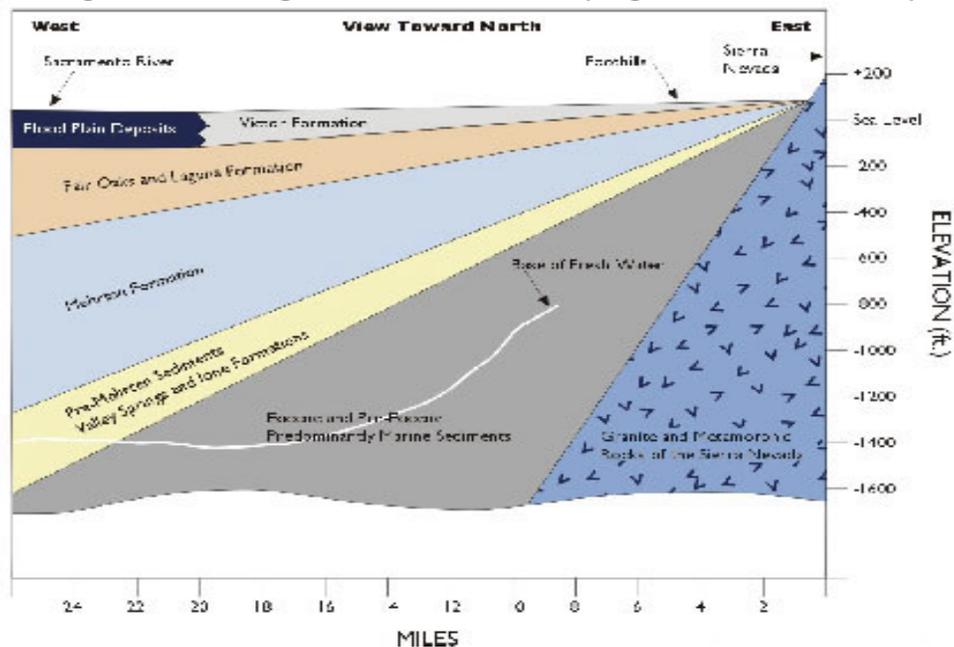
A core responsibility of SGA is to not exceed the average annual sustainable yield of the basin of 131,000 acre feet. To this goal, SGA published its Groundwater Management Plan (GMP) in December 2003. The complete GMA is included as Appendix B and summarized in the following paragraphs. The components of the GMP are:

- Stakeholder Involvement
- Groundwater Monitoring Program, including a data management system
- Groundwater Resource Protection, including control of the migration and remediation of contaminated groundwater
- Groundwater Sustainability, and
- Planning Integration.

CDWR Bulletin 118 identifies the Groundwater Basin to be #5.21.64, the “North American Subbasin of the Sacramento River Hydrologic Area.” THE SGA GMP cites CDWR as defining the subbasin boundaries as bounded on the west by the Sacramento and Feather Rivers, on the north by the Bear River, on the east by the Sierra Nevada, and on the south by the American Rivers. The SGA GMP addresses that portion of the basin in Sacramento County.

THE SGA GMP describes the various geologic formations that constitute the water – bearing deposits underlying Sacramento County. These formations include an upper unconfined aquifer system consisting of the Victor, Fair Oaks, and Laguna Formations and a lower semi-confined aquifer system consisting primarily of the Mehrten Formation. These formations are shown on Figure 4.

Figure 4 – Geologic Formations Underlying Sacramento County



From SGA Groundwater Management Plan, 2003, Figure 3

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These formations are typically composed of lenses of inter-bedded sand, silt and clay, interlaced with coarse-grained stream channel deposits. Together, they form a wedge that thickens from east to west to a maximum thickness of about 2,000 feet under the Sacramento River. RLECWD wells draw water from approximately 40 to 60 feet below sea level.

Groundwater Quality

The SGA Groundwater Management Plan includes an overview of basin water quality. Water quality of the upper aquifer system is viewed as superior to that of the lower aquifer system. The upper aquifer is preferred over the lower aquifer because the Mehrten formation contains higher concentrations of iron and manganese. Water from the upper aquifer generally does not require treatment other than disinfection. The lower aquifer system also has higher concentrations of total dissolved solids (TDS) than the upper aquifer, although it typically meets standards as a potable supply. At various depths, generally approximately 1,200 feet or greater, the TDS concentration exceeds 2,000 milligrams per liter (mg/L), which is considered non-potable without treatment.

Some groundwater quality parameters are annually tabulated in Consumer Confidence Reports to RLECWD customers and posted on the RLECWD website (www.rlecwd.com/).

Table 5 - Water Quality Parameters, Consumer Confidence Reports 2002-2005

Primary Standards						
Parameter	Units	Public Health Goal MCLG	Maximum Contaminant Level	Detection Limit for Reporting Purposes	Average	Range
Barium	Ug/L	1000	1000	100	61.27	ND_150
Fluoride	Mg/L	1	2	0.1	0.02	ND-0.2
Arsenic	Ug/L	NA	50	2	6.64	4-13
Chromium, Total	Ug/L	100	50	10	6.09	ND-16
Selenium	Ug/L	50	50	5	1.09	ND-12
Nitrate as NO3	Mg/L	45	45	2	4.45	2-11
TTHM's total trihalomethanes	Ug/L	N/A	80	N/A	0.14	ND-0.9
Secondary Standards						
Odor - Threshold	ton	none	3	N/A	1	1-1
Foaming Agents	Mg/L	none	0.5	N/A	0.15	.12-.17
Manganese	Ug/L	none	50	20	8.18	ND-90
Sulfate	Ug/L	none	250	0.5	7.1	4-11
Total Dissolved Solids	Mg/L	None	500	N/A	220	180-270

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These reports show current water quality to be within legal limits for potable water supply. Future revision of water quality regulations may reduce the Maximum Contaminant Limits (MCL) allowable for some constituents, such as the Federal MCL for arsenic which will become 10 U_g/L on January 23, 2006 and may be further reduced with new CDHS standards. RLECWD plans to remove wells #3 and #5 from service in 2006, since they would not meet the federal standard. If the new MCLs are below the constituent level yielded by existing or new wells, then other non-complying wells may require new treatment facilities. (RLECWD Master Plan Revised 2003).

A 2002 groundwater contamination study that included “27 public supply wells mainly from the northwest part of the county (north of Interstate 80, in Rio Linda and surrounding suburbs) had no detections of any of the volatile organic compounds (VOC) analyzed.” Analyzed VOCs included trichloromethane, chloroform, methyl tert ether (MtBE), tetrachloroethylene (PCE), dibromochloropropane (DBCP), benzene, toluene, ethylbenzene and xylene. (Source: “Ambient Groundwater Monitoring and Assessment – A Contamination Vulnerability Assessment for the Sacramento Area Groundwater Basin,” 2002, by Lawrence Livermore National Laboratory).

Within the SGA area, approximately 190 active LUFT (MBTE) sites were reported by the SGA from the SWRCBs Geotracker web site (<http://geotracker.swrcb.ca.gov/>). Review of the Geotracker website in October 2005, revealed ten LUFT sites in Rio Linda. Five of the sites are reported as “open,” but none of the reports indicate a current threat to existing public wells. While many of the sites can be remediated, the aggregate impact from undetected contamination on groundwater quality is undetermined in the SGA GMP.

The SGA GMP reports the existence of three principal contaminant plumes to be within or near the SGA area. The former McClellan Air Force Base plume encroaches under the southeastern corner of the RLECWD service area. The other two are more than ten miles distant to the southeast. For McClellan AFB, the primary contaminants of concern are trichloroethene (TCE), (PCE), cis-1, 2-dichloroethene (DCE), and 1, 2-dichloroethene (DCA). The McClellan AFB plume edges represent the California drinking water MCL of 5U_g/L TCE, the most extensive contaminant.

Montgomery Watson Harza reports that the direction and rate of movement of a contaminant in the groundwater depends on any number of factors including: bulk groundwater movement: physical, chemical and biological processes; molecular interactions between the contaminant and the soil; and remediation efforts to treat and/or contain the plumes. Changes in groundwater movement can occur if changes in the geographic distribution of extraction and recharge impact the slope of the cone of depression. If the slope gets steeper, groundwater will move faster. The direction may be influenced by nearby wells or the regional cone of depression. (Source: “Rio Linda /Elverta Community Water District Groundwater Investigation,” June 2001 Draft, MWH)

Movement of the McClellan AFB plume is currently constrained because contaminants are located near the center of the regional cone of depression. It is mandatory that

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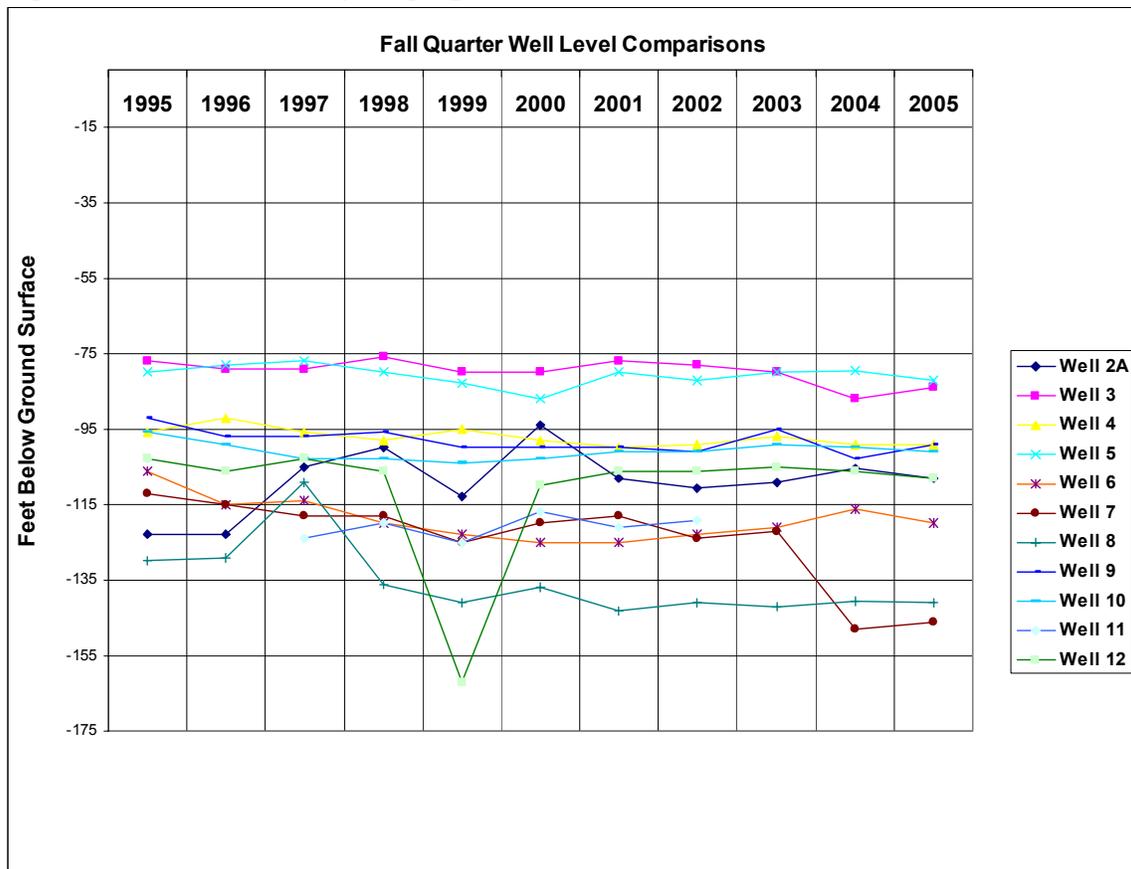
containment and remediation actions continue to clean up the contaminations. If the contamination is allowed to remain, then when groundwater levels rise with the conjunctive use program, there is some chance contamination could migrating toward water supplier wells.

Groundwater Sustainability

With the average sustainable yield of the basin estimated to be 131,000 acre feet, the CDWR has not identified the basin to be in overdraft, nor is the basin projected to be in overdraft. However, the basin has evidenced considerable reduction in groundwater levels.

Groundwater levels in Sacramento County north of the American River have generally decreased over many years. Many wells declined at an average rate of 1.5 feet per year in the center of the basin for the last 50 years through the late 1990s. Recently groundwater levels have stabilized largely due to the recent availability of surface water deliveries into the central part of the basin.

Figure 5 Groundwater Hydrographs within the RLECWD Service Area



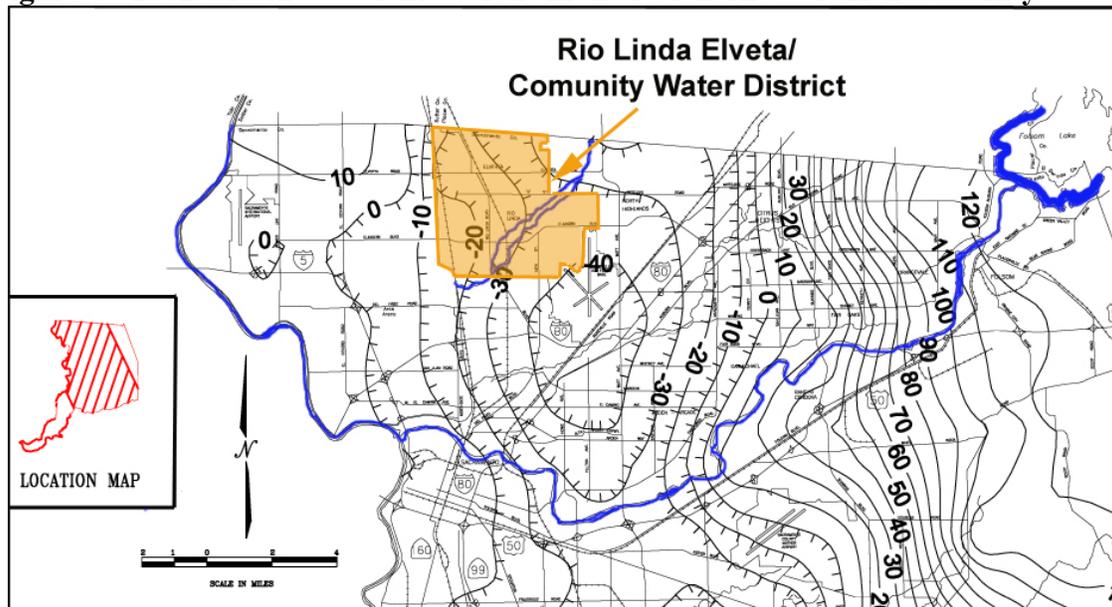
Natural recharge is a combination of subsurface flow that originates in the Sierra Nevada and foothills, and infiltration of local precipitation. Runoff occurs throughout the basin. Sources of non-natural uncontrolled recharge include leakage from pipelines, seepage

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through the boundaries of the groundwater basin, and net agricultural and landscape irrigation return flows. Natural recharge to the sub-basin is estimated at 83,900 acre feet and applied water recharge at 29,800 acre feet. Currently artificial recharge does not contribute significantly to total recharge. (Source: “Ambient Groundwater Monitoring and Assessment, 2002”, by Lawrence Livermore National Laboratory).

The previously mentioned groundwater decline was a result of groundwater extraction to meet local agricultural and urban demands. A consequence of this extraction is a persistent groundwater cone of depression roughly centered near McClellan AFB.

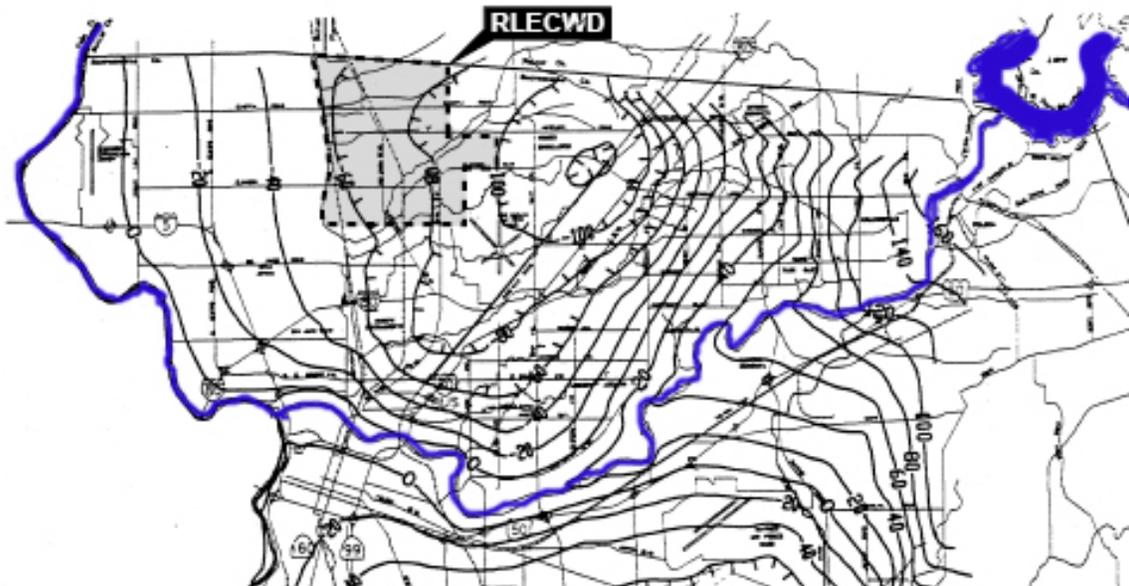
Figure 6 - 2002 Groundwater Elevations in the Northern Sacramento County



Source: Sacramento County Groundwater Elevations Fall 2002

Studies performed for Sacramento County in 1997 and RLECWD in 2001 both predict that additional pumping will initially cause groundwater levels to further decline. After several decades, groundwater levels tend to reach equilibrium with fluctuations in response to wet and dry hydrologic cycles.

Figure 7 - Projected 2030 Groundwater Elevations in Northern Sacramento County



Source: Baseline Conditions for Groundwater Yield Analysis, May 1997, County of Sacramento

In 1999, Sacramento County applied policy PF-8 for the Rio Linda and Elverta Community Plan. PF-8 called for implementation of long term programs to sustain the yield of the groundwater basin. In the new growth area in eastern Elverta, and other comprehensively planned development areas, entitlements for urban development shall not be granted until the Board of Supervisors makes one of the following findings:

- (i) that an agreement between the developer and either the domestic water purveyor serving the area (the Rio Linda/Elverta Community Water District and/or Citizens Utilities Company) or the SGA be executed which
 - (a) assures that arrangements are in place to deliver supplemental water supplies (i.e., surface water, reclaimed water, etc.) within the boundaries of the SGA in quantities sufficient to prevent a long-term net increase in groundwater pumping resulting from the proposed development, and
 - (b) assures that funding is made available to either the domestic water purveyor or the SGA for all costs for delivery of such supplemental water supplies; or
- (ii) that an appropriate groundwater management program has been adopted by the SGA to protect the long-term sustainable yield of the groundwater basin underlying the area for which an entitlement is sought, and that the water use resulting from such entitlement is subject to and consistent with such groundwater management program.

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An approved SGA 2003 Groundwater Management Plan may satisfy requirement (ii). To prevent a long-term net increase in groundwater pumping related to the Elverta Specific Plan, two new strategies are being developed. The first is for RLECWD to obtain up to 5,000 AFPY of Sacramento Suburban WD's 29,000 AF purchase of PCWA surface water. This may occur as early as 2006. The second is to supply treated reclaimed wastewater from the City of Roseville to the Cherry Island Golf Course and Gibson Ranch Park. These sites are adjacent the RLECWD service area and currently self supplied with groundwater from the same basin as RLECWD. This strategy would reduce the withdrawals from groundwater by up to 2000 AFPY. See discussion in chapter 9, Recycled Wastewater.

For the past five years RLECWD has pumped the following amounts of groundwater:

Table 6 - Groundwater Pumped 2000-2004 by RLECWD - AFPY

Basin	2000	2001	2002	2003	2004
North American Sub-basin	3,334	3,268	3,387	3,163	3,407
Percent of Total Water Supply	100	100	100	100	100

A new well is budgeted for construction and operation in 2006.

Table 7 – RLECWD Groundwater Pumping Forecast 2010- 2030 - AFPY

Basin	2010	2015	2020	2025	2030
North American Sub-basin	4,160	6,550	7,800	12,900	18,000
Percent of Total Water Supply	60	60	55	65	70