FUGRO WEST, INC.

4820 McGrath Street, Suite 100
Ventura, California 93003-7778
Tel: (805) 650-7000
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September 16, 2010
Project No. 3033.006.07

Carpinteria Valley Water District
Post Office Box 578
Carpinteria, California 93014

Attention: Mr. Charles Hamilton, General Manager

Subject: Carpinteria Groundwater Basin, Annual Report for 2009

Dear Mr. Hamilton:

Presented in this annual report is a summary and description of groundwater conditions in the Carpinteria groundwater basin for calendar year 2009. This represents the ninth annual report that has been prepared to assist the Carpinteria Valley Water District (District) in its ongoing efforts (pursuant to its AB3030 Groundwater Management Plan) to manage the groundwater resources of the basin and provide information on water level and water quality conditions to all users of groundwater in the basin. The intent of the annual report is to provide a brief narrative and graphics that document the "health" of the basin's groundwater resources, trends in groundwater levels and water quality, information on land use, and annual groundwater pumpage. Information on the development of the program, selection of wells to be sampled, and surface water sampling points, etc., is available in prior reports prepared for the District.

Three large maps form an integral part of this report. Plate 1 - Water Level Hydrograph Map, April 2009, depicts wells in the basin used for purposes of water level measurements and to assess changes in groundwater in storage. This map shows the physical limits of the groundwater basin, locations of the key wells, historical variations in water levels, and water level contours during the period of April 2009. Plate 2 depicts water level contours during October 2009, during which groundwater pumpage was less relative to fall pumpage. Plate 3 - Chemical Hydrograph Map, depicts the location of wells that are used to monitor water quality in the basin. This map depicts trends of several important water quality constituents for ground and surface water that are routinely obtained as part of the semiannual water quality data collection program. The data provide information on the concentration and spatial distribution of total dissolved solids, nitrate ions, and chloride ions. Both of these maps are updated annually and included in each annual report.

PRECIPITATION

Groundwater recharge occurs by direct infiltration of precipitation, streambed percolation, irrigation return flow, and to a limited extent, by underflow from the "hill and mountain" area. Precipitation in the Carpinteria area for the 2009 calendar water year was recorded at 14.38 inches at the Carpinteria Fire Station. Precipitation data at the Carpinteria Fire Station have been collected for 61 years between 1949 to the present, during which average annual precipitation was 19.87 inches. A graph showing the cumulative departure from average precipitation is presented as Figure 1. The departure from average precipitation is the difference between precipitation in a specific year and the average precipitation for the period. Figure 1 depicts the sum of these departures over time (cumulative). Based on the cumulative departure from average precipitation at this station, there have been a series of cyclic wet and dry periods. Within the period of record, dry cycles have occurred between 1949 and 1960 (11 years or more) and between 1984 and 1990 (6 years). The current relatively dry cycle has lasted from 1999 to 2009 (10 years).

Groundwater Levels

Water level measurements are made by District staff on a bimonthly basis for about 34 wells in the basin. The locations of these wells are shown on Plates 1 and 2. The water level data were obtained from District staff and hydrographs prepared for 17 key wells, which are shown on Plates 1 and 2. The data were then used to prepare water level elevation contours, which are shown on Plate 1 for the April 2009 period and on Plate 2 for the October 2009 period. The contours are representative of water levels within wells perforated in several depth zones. Therefore, the contours represent a composite of many different depth zones, not water level conditions in a single, common aquifer.

During 2009, water levels in the basin were significantly lower than during the same period during the previous year and at or below sea level in the western portion of the District. During October 2009, the time period presented on Plate 2, a significant pumping depression was present in the central portion of the District. The pumping trough was as deep as about 15 feet below sea level during the October 2009 measurement period and several feet below sea level at the coast, a condition that could allow sea water intrusion. However, there is no documented evidence of sea water intrusion in the basin. As is usual, several wells included in the water level measurement program were actively pumped or influenced by nearby pumping wells at the time of the October survey, resulting in a relatively limited number of wells with data.

Water level data from the 20-year period between 1990 and 2009 indicate that water levels are commonly higher in the winter and spring due to recharge from precipitation and lower total groundwater pumpage, and relatively lower in summer and autumn due to pumping of groundwater from wells within the District. In general, the hydrographs presented on Plates 1 and 2 show that over the 5-year period (2005 through 2009), water levels in Storage Unit No. 1 have locally fallen by as much as 15 to 25 feet. In the past year, due to below normal precipitation and annual groundwater pumpage in the range of 4,000 acre feet (refer to Figure 2, water levels in the central part of Storage Unit No. 1 have locally an additional 5 to 10 feet locally. The area of most significant decline is in Sections 19, 20, and 29. This amount of water level decline has in the past typically recovered within a 2 to 3 year cycle of above average rainfall, such as occurred beginning in 1992.

There has been no significant change in water levels in Storage Unit No. 2, likely due in part to the very limited number of wells that are monitoring in this part of the basin and the very limited amounts of groundwater pumped from this storage unit.

Groundwater Use

Groundwater pumpage in the basin occurs both from District production wells (see Plates 1 and 2) and from about 100 private wells. Pumpage from District wells are metered. The District supplies imported water and/or local groundwater to numerous agricultural parcels of known acreage and crop type (lemon, avocado, greenhouse, flower fields). From these metered deliveries, unit water use values (so called determining factors) for various crop types can be used to estimate private groundwater pumpage. For calendar year 2009, unit water values were assigned to land uses based on 2009 land use data. Based on this calculation, a private pumpage estimate of 2,596 acre-feet was calculated. Summaries of District groundwater pumpage and imported water amounts for 2009 are included in Appendix A - Supporting Data.

Groundwater pumpage from the basin by the District in calendar year 2009 was 1,488 acre-feet. This volume of pumpage was approximately 120 percent of the 20-year District pumpage average of about 1,241 acre-feet. Groundwater pumpage in the District from calendar years 1990 through 2009 are presented in Figure 2 - Water Use and Precipitation Data, Carpinteria Valley, and in Table 1 - Water Use and Precipitation Data. Imported water volumes (Casitas MWD, State Project water, and Lake Cachuma water) and seasonal precipitation totals are also provided. As indicated, groundwater pumpage in the basin from 1990 to 2009 has averaged about 3,730 acre-feet per year (afy), and ranged from as high as 5,472 afy in 1990, to as low as 2,484 afy during 2001. Of the groundwater pumped, District pumpage has typically been about one-quarter to one-third of the total, which was the case during 2009.

Table 1. Water Use and Precipitation Data

Calendar Year	Rainfall (inches)	Estimated Private Pumpage (acre-feet)	Metered CVWD Pumpage (acre-feet)	Imported Water (acre-feet)	Total Pumpage (acre-feet)	District Use (percent)
1990	7.75	1,964	3,508	1,774	**5,472**	64
1991	26.13	2,351	2,664	1,434	**5,015**	53
1992	27.05	2,174	1,178	3,155	3,352	35
1993	32.62	2,434	1,524	2,808	3,958	39
1994	15.02	2,780	1,305	3,206	4,085	32
1995	41.35	2,418	1,340	2,995	3,758	36
1996	25.86	2,597	1,410	2,896	4,007	35
1997	19.98	2,504	1,242	3,429	3,746	33
1998	41.35	2,481	469	3,549	2,950	16
1999	8.91	2,400 [1]	535	3,907	2,935	18
2000	18.99	2,400 [1]	1,210	2,959	3,610	34
2001	24.23	2,400 [1]	84	3,497	2,484	3
2002	12.28	3,116	662	3,774	3,778	18
2003	14.62	2,596 [2]	446	3,769	3,042	15
2004	19.42	2,698 [2]	1,265	3,884	3,963	32
2005	27.20	2,183 [2]	940	3,693	3,123	30
2006	16.86	2,270 [2]	1,142	3,147	3,412	33
2007	9.67	2,606	1,340	2,684	3,946	34
2008	19.22	2,865[3]	1,074	2,842	3,939	27
2009	14.39	2,596	1,488	2,835	4,084	36
Mean	21.14	2,492	1,241	3,112	3,733	31
Maximum	41.35	3,116	3,508	3,907	5,472	64
Minimum	7.75	1,964	84	1,434	2,484	3

Notes: 1) 1999 to 2001 private pumpage estimated based on long-term average.
2) 2003 to 2006 private pumpage based on land use data of 2004 and 2006
3) 2008 private pumpage are considered provisional.
Bolded values of Total Pumpage exceed 5,000 acre-feet "safe yield"

The estimated 5,000 afy safe yield of the basin, (GTC, 1976 and 1986), has been exceeded only twice in the last 20 years in 1990 and 1991. During the remaining years, total groundwater pumped has been less than 5,000 afy and, on average, has been about 1,435 afy less than the estimated safe yield. Pumpage less than the basic safe yield since about 1992 resulted in a recovery of water levels in the basin and an accumulation of groundwater in storage. In 2003, the District retained the firm of Integrated Water Resources, Inc. (IWR) to perform an independent review of the perennial yield of the basin. The results of that study reasserted that a basin safe or perennial yield of 5,000 afy was appropriate.

GROUNDWATER QUALITY

Groundwater quality in the Carpinteria basin is monitored by collecting samples from as many as 30 wells and 6 surface water stations on a biannual basis (spring/fall). The data collection program was initiated by the District in early 1999. Laboratory analyses performed include a full range of inorganic chemical constituents typically referred to as "Irrigation Suitability Analysis."

Groundwater quality in the basin continues to be suitable for most beneficial usages. As shown on Plate 3, total dissolved solids (TDS) concentrations for most wells range from 600 to 1,000 milligrams per liter (mg/l). Nitrate concentrations within Well -19MI, which have been elevated in past years with concentrations of over 400 mg/l, have moderated to below approximately 200 mg/l. By contrast, nitrate concentration within well -19E1 was much lower, with a maximum concentration of 10.5 mg/l during 2009. During 2009, nitrate concentrations in Well -20R4 have increased to a maximum of 112 mg/l. Nitrate concentrations within Well -28F7 (Lyons Well) have been rising modestly for the past several years up to approximately 31 mg/l during 2009.

During 2009, chloride concentrations within Wells -19MI and adjacent -19E1 were over 300 mg/l. With the exception of a single low value, chloride concentrations in well -19MI have remained relatively steady for the past several years. Well -19M1 is 204 feet deep and likely has very shallow perforations although the actual depth interval is unknown. Well -19E1 is located approximately 900 feet north and is a relatively shallow well. Comparison of quality data from the two wells shows that, although chloride concentrations are higher than many monitored wells, neither nitrate nor TDS are as elevated as those in Well -19M1.

Groundwater in the basin is generally characterized as calcium bicarbonate in chemical nature and locally demerited by the presence of elevated nitrate and chloride ion concentrations in shallow aquifers in Sections 19 and 20 of the basin. Other than the locally high nitrate ion concentrations in Section 19 and 20, the groundwater quality appears stable with no long-term trends toward impairment.

SUMMARY AND CONCLUSIONS

Based on the data for 2009 and the preceding years, aquifers in the Carpinteria basin continue to be adequately recharged in average to above average precipitation years, and provide a generally high quality of groundwater for the prevailing usages. By the fall of 2009 water levels in the central part of Storage Unit No. 1 had fallen to elevations below sea level. This is the first time that water levels have fallen to below sea level since the early 1990s (refer to Plate 2). Groundwater pumpage from the basin in 2009 was estimated to be approximately 4,084 acre-feet. At this rate of pumpage and the overall deficient rainfall for the last several years, water levels are falling at rates of about 5 feet per year. It should be noted that no annual determination of recharge components or a water balance in the basin have been performed in over 20 years (GTC, 1986). We understand that the District is in the process of completing an updated water balance and numerical groundwater flow model of the basin to assist in overall groundwater management objectives. The findings of this study should be available in late 2010. No adverse water quality conditions or trends are apparent in the basin other than the occurrence of elevated nitrate and chloride ion concentrations in two shallow wells in the western portion of the basin.

We recommend that the data collection program (water levels and water quality) be maintained in its current form in subsequent years with the following modifications:

- Prepare a map illustrating the annual change of water level elevation and integrate these data using GIS to estimate the annual change of groundwater in storage. The map should consider the period from each spring to the following (or prior) spring period.

- Attempt to target the timing of the collection of water level data throughout the year to avoid the influence of pumping wells (in particular, District wells).
- The District should develop a process with the Santa Barbara County Environmental Health Department (EHD) that ensures the District will be routinely and automatically informed of all new well construction, well rehabilitation, and well destruction permits filed with the EHD, including receipt of State Well Completion Reports, geophysical electric logs, and water quality analysis.
- Develop a more formal conjunctive use operational model of the District water supplies that integrates groundwater and imported water supplies to take better advantage of the accumulated groundwater storage potential of the basin.
- The nitrate concentration in the District's Lyons well has been rising modestly and should be monitored at several intervals throughout a typical pumping cycle to determine if the concentrations are related duration of the pumping cycle.

With the observed drop in water levels in the central part of Storage Unit No. 1 the District may want to consider expanding the water quality monitoring program to include additional wells and more frequent monitoring (perhaps quarterly) for general mineral constituents, particularly chloride ion concentrations. The expanded monitoring should focus on qualified wells (suitable depth and perforated interval) located in Sections 19, 20, 28, and 29.

CLOSURE

This report has been prepared for the exclusive use of the Carpinteria Valley Water District and their agents for specific application to the conditions of groundwater supply and quality in the Carpinteria groundwater basin in Carpinteria, California. The findings and conclusions presented herein were prepared in accordance with generally accepted hydrogeologic engineering practices. No other warranty, express or implied, is made.

Sincerely,

FUGRO WEST, INC.

Timothy A. Nicely, P.G., C.Hg.
Project Hydrogeologist

David A. Gardner, CHg 122
Principal Hydrogeologist

Attachments: Figure 1 - Cumulative Departure from Average Precipitation
Figure 2 - Water Use and Precipitation Data
Plate 1 - Water Level Hydrograph Map, April 2009 Period
Plate 2 - Water Level Hydrograph Map, October 2009 Period
Plate 3 - Chemical Hydrograph Map
Appendix A - Supporting Data

Copies Submitted: (20) Addressee

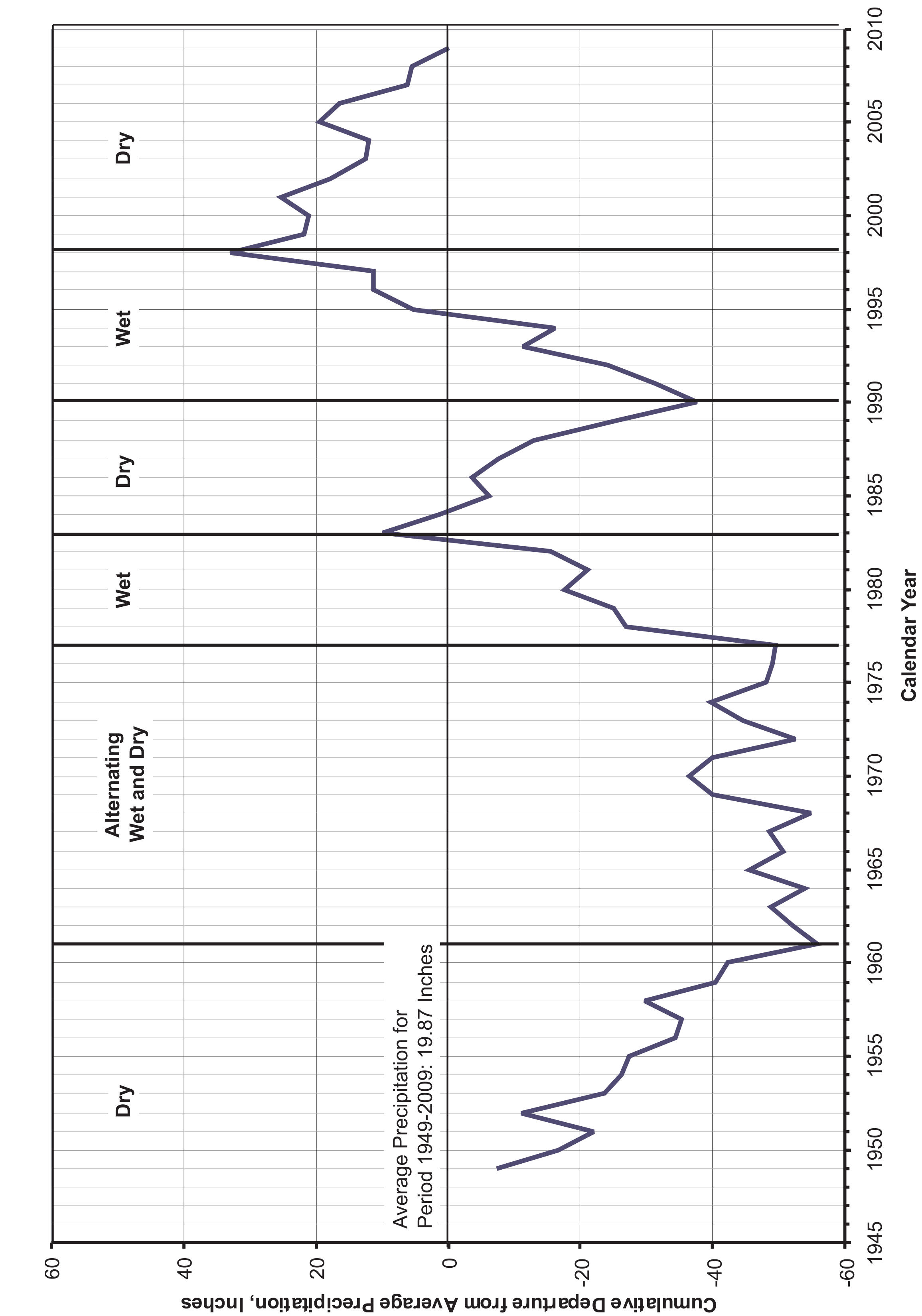
REFERENCES

Geotechnical Consultants, Inc. (1976), *Hydrogeologic Investigation of the Carpinteria Ground Water Basin,* consultant's unpublished report prepared for the Carpinteria County Water District, June 11.

______ (1986), *Hydrogeologic Update, Carpinteria Groundwater Basin*, consultant's unpublished report prepared for the Carpinteria County Water District, July.

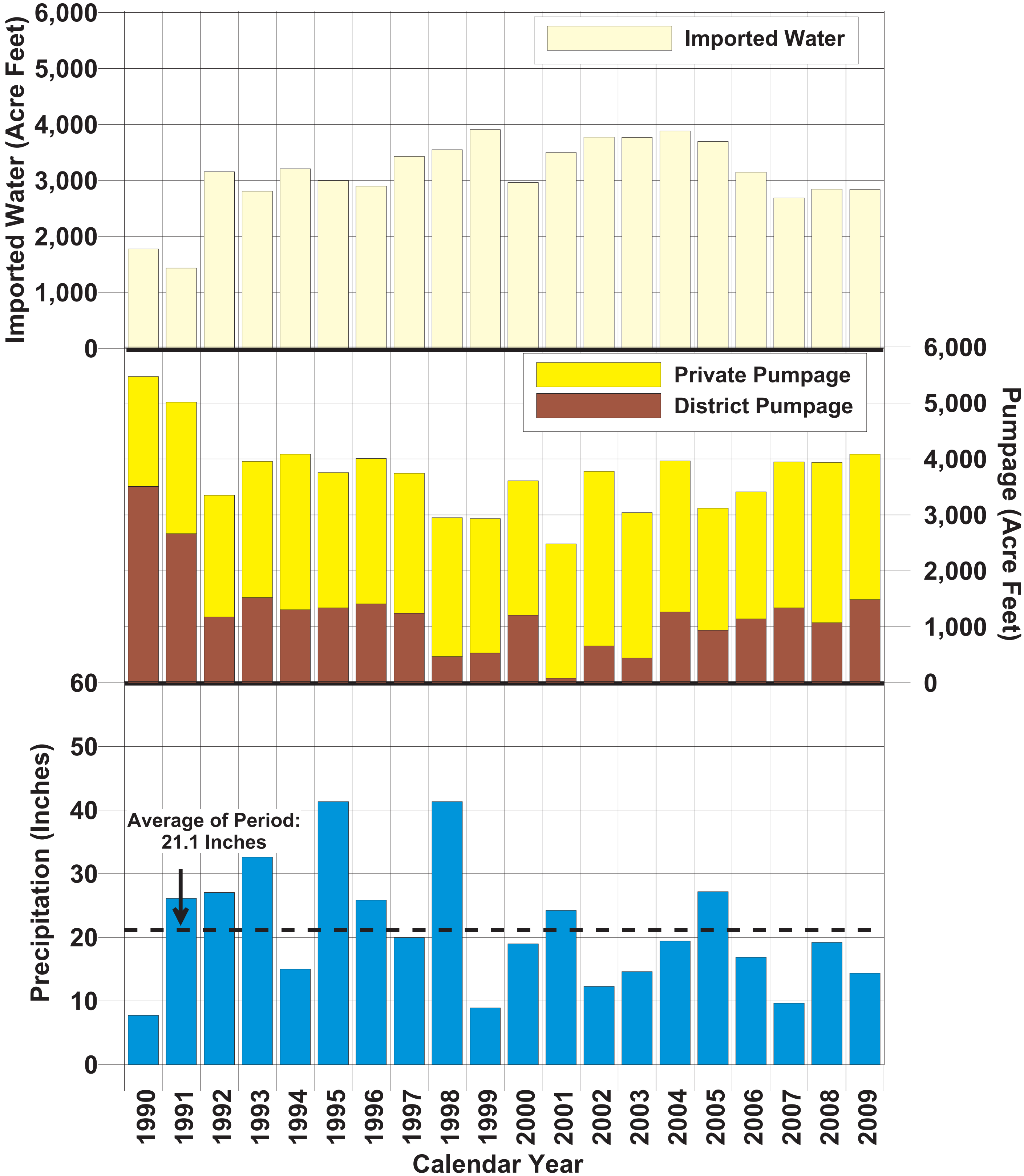
Integrated Water Resources, Inc. (IWR, 2003) *Perennial Yield Review of the Carpinteria Valley Groundwater Basin*, consultant's unpublished report prepared for the Carpinteria County Water District, February 25.

FIGURES



CUMULATIVE DEPARTURE FROM AVERAGE PRECIPITATION
Carpinteria Fire Station
Carpinteria Valley Water District

FIGURE 1



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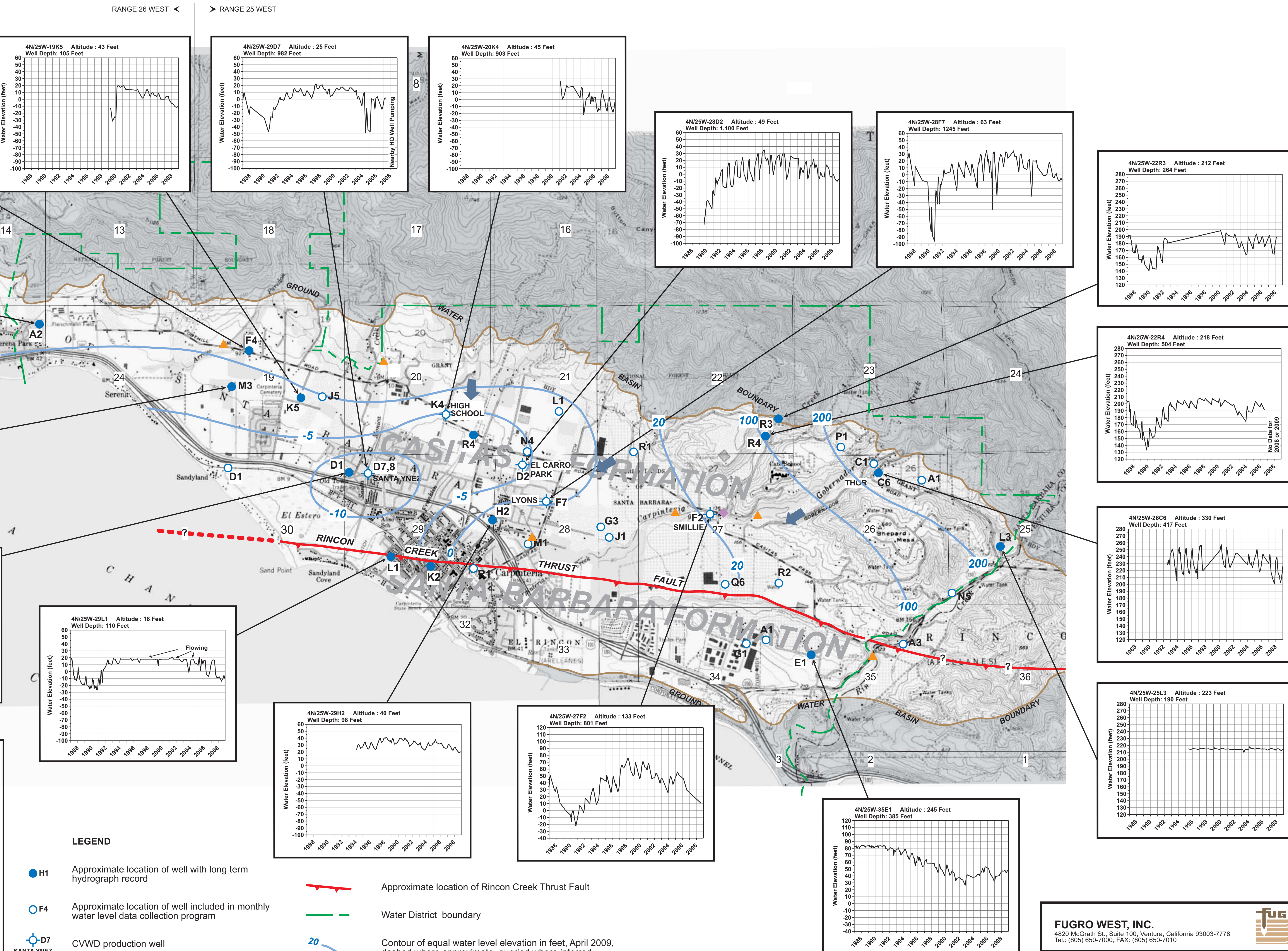
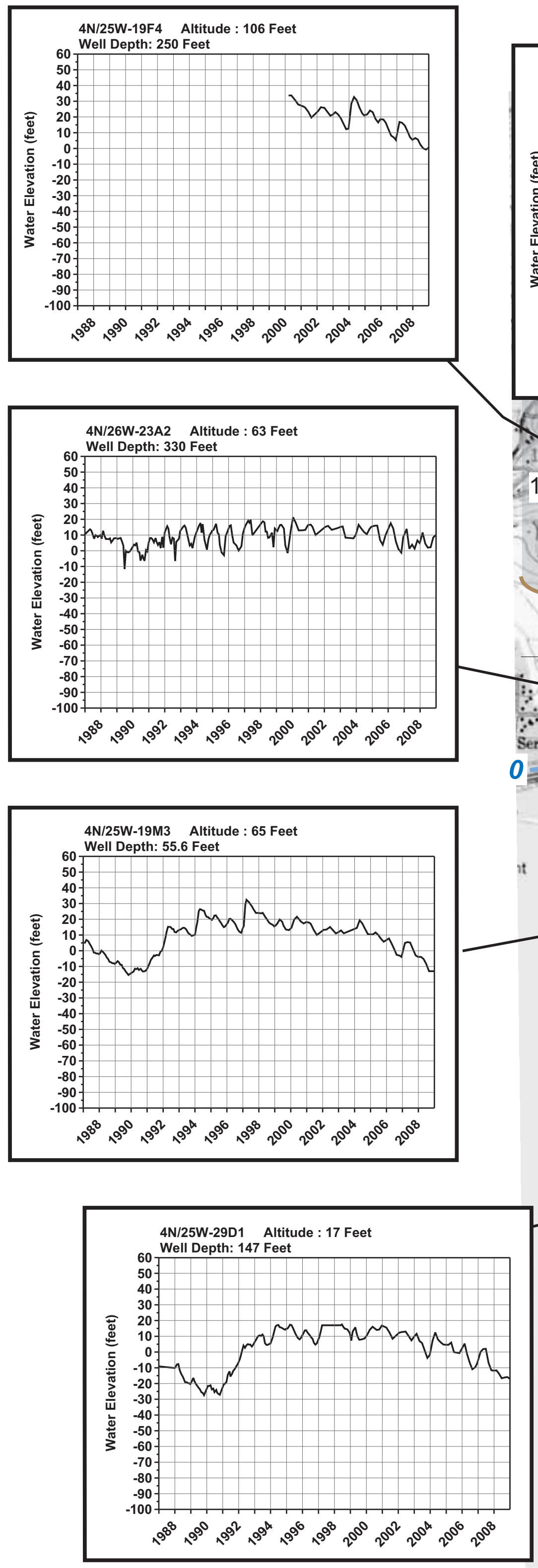
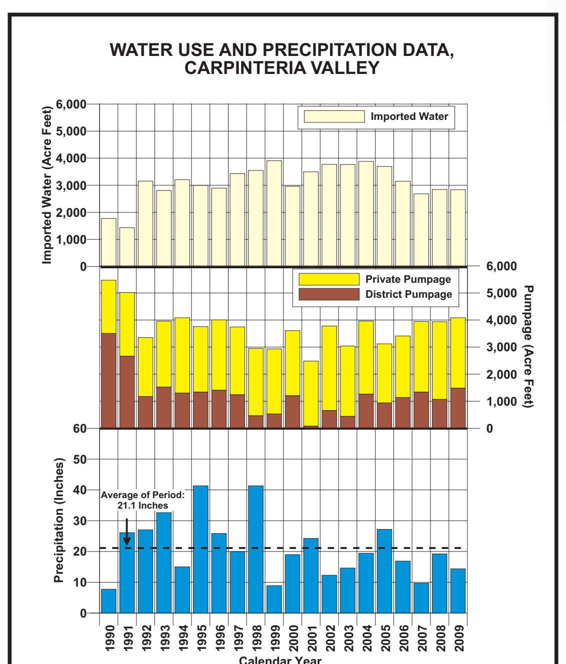
WATER USE AND PRECIPITATION DATA
Carpinteria Valley Water District

FIGURE 2

PLATES







BASE MAP SOURCES: USGS 7.5' California quadrangle maps, Carpinteria (photorevised 1988) and White Ledge Peak (photorevised 1967).

LEGEND

- H1 — Approximate location of well with long term hydrograph record
- F4 — Approximate location of well included in monthly water level data collection program
- D7 SANTA YNEZ — CVWD production well
- Casitas Pass Road Precipitation Station No. 383, Santa Barbara County
- Surface water quality monitoring station
- Groundwater basin boundary
- Approximate location of Rincon Creek Thrust Fault
- Water District boundary
- 20 — Contour of equal water level elevation in feet, April 2009, dashed where approximate, queried where inferred
- Principal direction of groundwater flow
- Water well hydrograph, altitude of water surface in feet

NORTH

0 3000 6000

FEET

FUGRO WEST, INC.
4820 McGrath St., Suite 100, Ventura, California 93003-7778
Tel.: (805) 650-7000, FAX: (805) 650-7010

WATER LEVEL HYDROGRAPH MAP APRIL 2009 PERIOD

Client: CARPINTERIA VALLEY WATER DISTRICT

Project No. 3033.006.07 July 2009 PLATE 1

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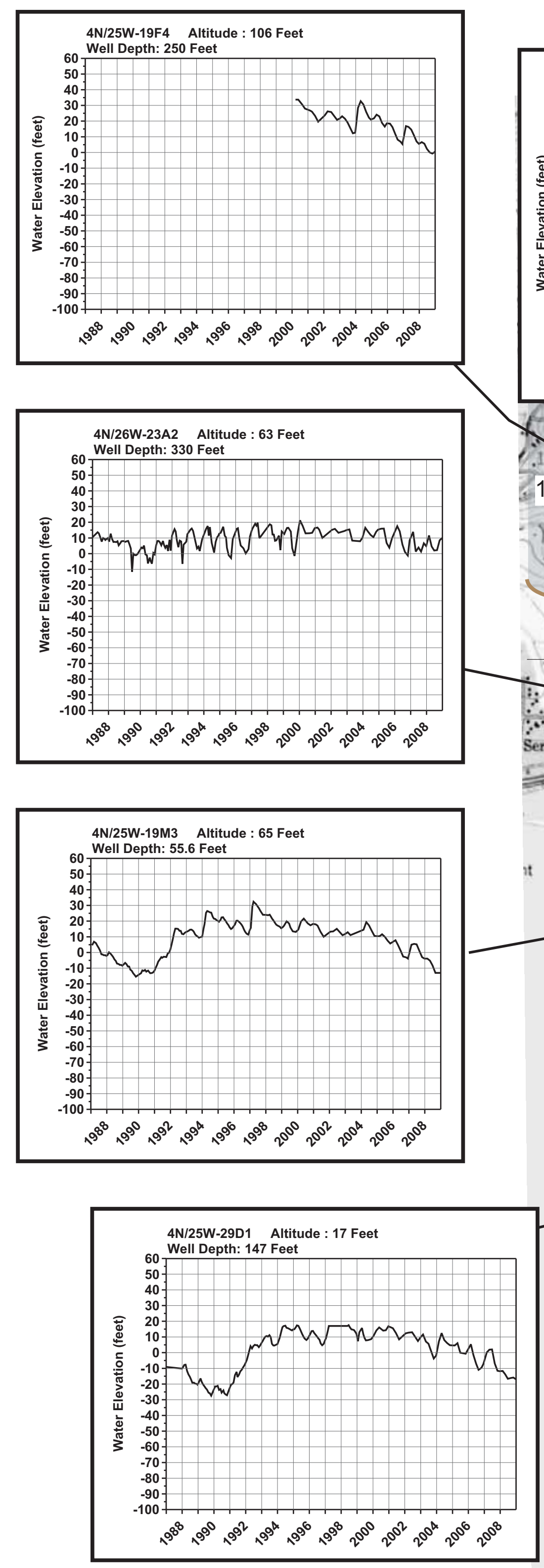

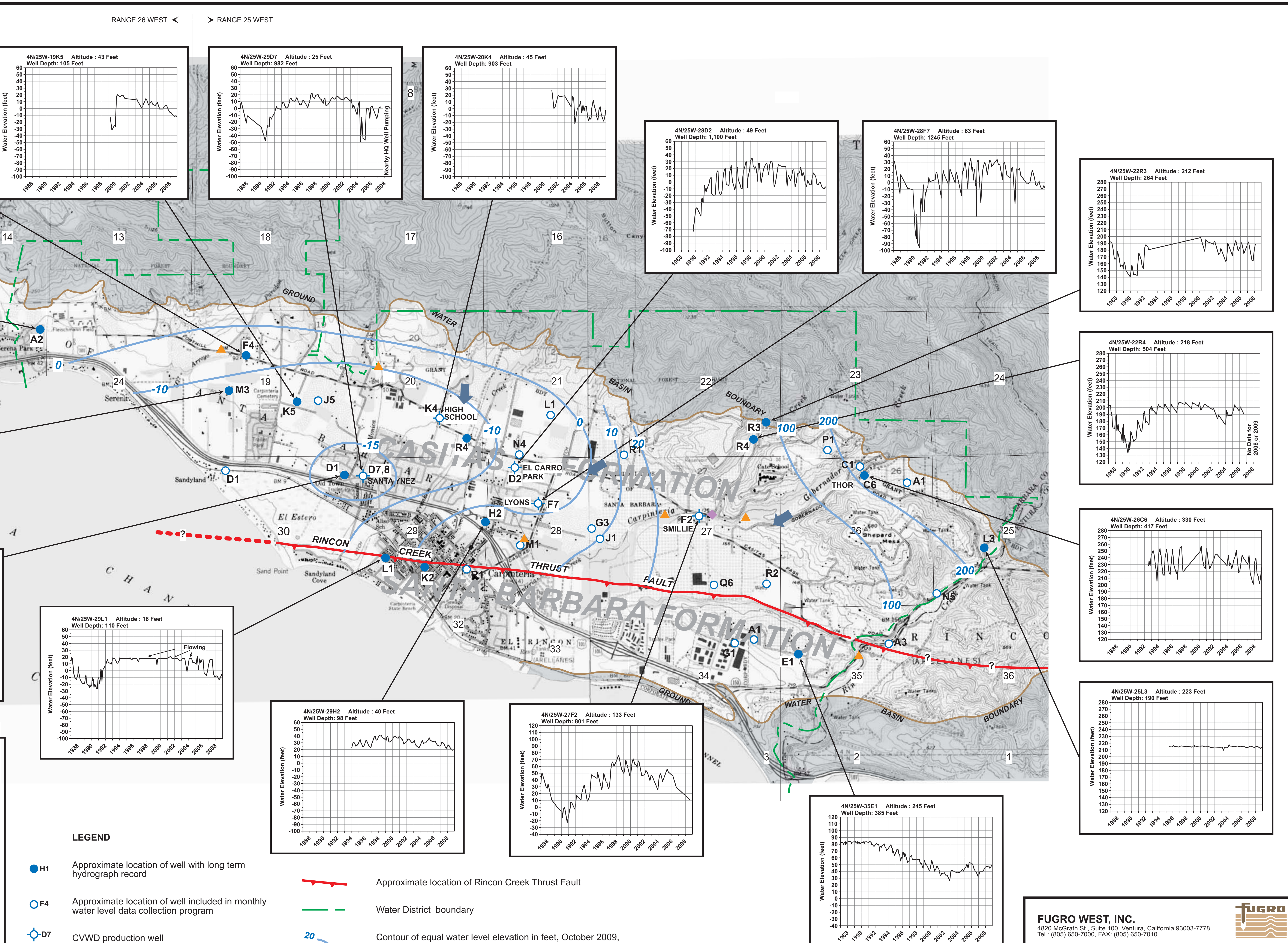

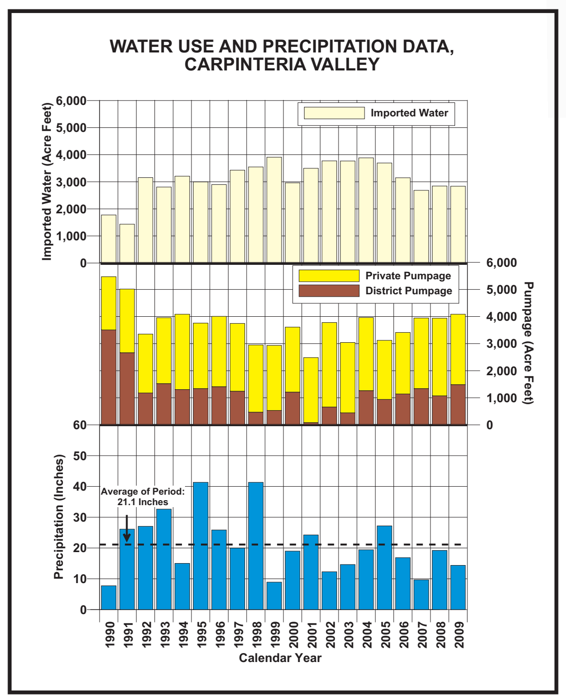

LEGEND

- H1 — Approximate location of well with long term hydrograph record
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- Water District boundary
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- Principal direction of groundwater flow
- Water well hydrograph, altitude of water surface in feet

NORTH

0 3000 6000 FEET

BASE MAP SOURCES: USGS 7.5' California quadrangle maps, Carpinteria (photorevised 1988) and White Ledge Peak (photorevised 1967).

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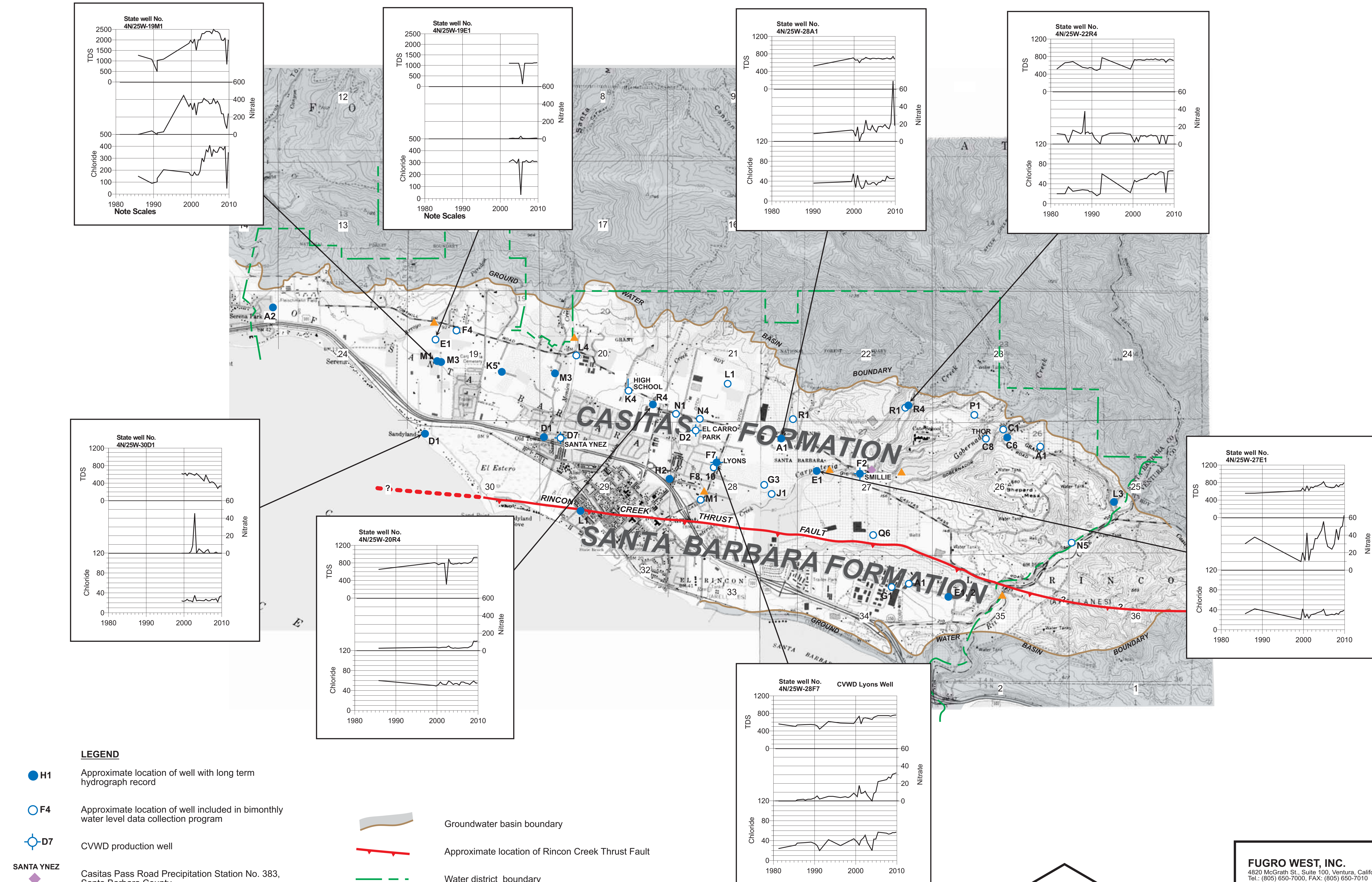
FUGRO WEST, INC.
4820 McGrath St., Suite 100, Ventura, California 93003-7778
Tel.: (805) 650-7000, FAX: (805) 650-7010

WATER LEVEL HYDROGRAPH MAP OCTOBER 2009 PERIOD

Client: CARPINTERIA VALLEY WATER DISTRICT

Project No. 3033.006.07 July 2009 PLATE 2



LEGEND

H1	Approximate location of well with long term hydrograph record
F4	Approximate location of well included in bimonthly water level data collection program
D7	CVWD production well
SANTA YNEZ	Casitas Pass Road Precipitation Station No. 383, Santa Barbara County
	Surface water quality monitoring station
	Groundwater basin boundary
	Approximate location of Rincon Creek Thrust Fault
	Water district boundary
	Chemical Hydrograph, all constituents in milligrams per liter (mg/l)

BASE MAP SOURCES: USGS 7.5' California quadrangle maps, Carpinteria (photorevised 1988) and White Ledge Peak (photorevised 1967).

NORTH

0 3000 6000

FEET

FUGRO WEST, INC.
4820 McGrath St., Suite 100, Ventura, California 93003-7778
Tel.: (805) 650-7000, FAX: (805) 650-7010

CHEMICAL HYDROGRAPH MAP

Client: CARPINTERIA VALLEY WATER DISTRICT

Project No. 3033.006.07 July 2009 PLATE 3

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APPENDIX A
SUPPORTING DATA

PUBLIC WATER SYSTEM STATISTICS

Calendar Year **2009**

Carpinteria Valley Water District
Robert McDonald, District Engineer
1301 Santa Ynez Avenue
Carpinteria, CA 93013
PWS# 4210001 SRO

1. General Information

Please follow the provided instructions.

Contact : Robert McDonald
Title: District Engineer
Phone: 805-684-2816
Fax: 805-684-3170
E-mail: bob@cvwd.net
Website: www.cvwd.net
County: **Santa Barbara**
Population served: **18685 (estimate)**
Names of communities served: City of Carpinteria and unincorporated areas of Santa Barbara County

2. Active Service Connections

Customer Class	Potable Water		Recycled Water	
	Metered	Unmetered	Metered	Unmetered
Single Family Residential	3073	0	0	0
Multi-family Residential	317	0	0	0
Commercial/Institutional	278	0	0	0
Industrial	59	0	0	0
Landscape Irrigation	0	0	0	0
Other	124	0	0	0
Agricultural Irrigation	427	0	0	0
TOTAL	4278	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*	127.61	142.34	107.85	158.92	159.41	149.99	56.60	67.97	161.88	98.30	130.84	126.25	1487.96
	Surface	0	0	0	0	0	0	0	0	0	0	0	0	0
	Purchased 1/	111.32	55.27	130.87	215.42	311.82	270.72	449.42	433.64	316.00	255.00	209.79	76.45	2835.72
	Total Potable	238.93	197.61	238.72	374.34	471.23	420.71	506.02	501.61	477.88	353.3	340.63	202.7	4323.68
Untreated Water		0	0	0	0	0	0	0	0	0	0	0	0	0
Recycled 2/		0	0	0	0	0	0	0	0	0	0	0	0	0

1/ Potable wholesale supplier(s): Cachuma Project & SWP

2/ Recycled wholesale supplier(s):

Level of treatment:

4. Metered Water Deliveries - Units of delivery: **CCF**

(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		31670	28687	29695	30756	48808	43060	53167	43007	47526	36610	29173	33064	455223
B.Multi-family Residential		13573	12294	12726	13181	20918	18454	22786	18431	20368	15690	12503	14170	195094
C.Commercial/Institutional		12021	11572	13715	16738	27005	23099	32665	23581	26720	17445	12894	14253	231708
D.Industrial		3180	2951	3124	2866	4236	4011	4271	3839	3800	3506	2638	2414	40836
E.Landscape Irrigation		0	0	0	0	0	0	0	0	0	0	0	0	0
F.Other		0	0	0	0	0	0	0	0	0	0	0	0	0
Total Urban Retail ***(A thru F)***		60444	55504	59260	63541	100967	88624	112889	88858	98414	73251	57208	63901	922861
Agricultural Irrigation		35878	34298	39540	73014	101648	78232	120251	95468	112617	68179	58079	35175	852379
Wholesale *(to other agencies)*		0	0	0	0	0	0	0	0	0	0	0	0	0

Santa Barbara County Flood Control District
123 E. Anapamu St., Santa Barbara, CA 93101
(805) 568-3440, Fax (805) 568-3434
Official Rainfall Record
Monthly Depth Durations and Expected Return Periods
208 Station:

Station Name: Carpinteria Fire Station
Station Type: Data Logger w/Tipping Bucket & Wedge Latitude: 342353 Longitude: 1193106
Elevation: 15

YEAR	WY	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	WY	CY	CY Total
1948-49	1949	0.00	0.00	0.00	2.96	1.60	1.14	1.95	0.00	1.44	0.10	0.00	0.00	9.19		
1949-50	1950	0.00	0.00	2.71	3.51	2.51	3.06	1.33	0.43	0.00	0.15	0.10	0.00	13.80	1949	12.45
1950-51	1951	0.70	0.68	1.46	0.32	2.13	1.44	0.63	1.63	0.00	0.00	0.00	0.10	9.09	1950	10.74
1951-52	1952	0.00	0.90	2.05	5.48	12.08	0.05	7.18	2.27	0.00	0.00	0.00	0.00	30.01	1951	14.36
1952-53	1953	0.00	0.00	4.00	5.20	1.70	0.00	1.27	1.71	0.00	0.00	0.00	0.00	13.88	1952	30.78
1953-54	1954	0.00	0.00	2.60	0.15	6.25	2.70	4.35	0.38	0.00	0.00	0.00	0.00	16.43	1953	7.43
1954-55	1955	0.00	0.00	1.75	1.75	4.95	2.25	0.35	3.05	0.60	0.00	0.00	0.00	14.70	1954	17.18
1955-56	1956	0.00	0.00	1.65	5.93	7.80	0.82	0.00	2.83	1.12	0.00	0.00	0.00	20.15	1955	18.78
1956-57	1957	0.00	0.08	0.00	0.30	4.60	3.46	0.49	1.76	1.03	0.00	0.00	0.00	11.72	1956	12.95
1957-58	1958	0.00	1.70	0.80	5.00	3.08	8.77	6.51	5.68	0.32	0.00	0.00	0.00	31.86	1957	18.84
1958-59	1959	1.19	0.00	0.00	0.08	2.20	4.67	0.00	1.33	0.00	0.00	0.00	0.00	9.47	1958	25.63
1959-60	1960	0.00	0.00	0.00	0.92	3.60	3.72	1.26	2.17	0.00	0.00	0.00	0.00	11.67	1959	9.12
1960-61	1961	0.00	0.06	7.11	0.00	1.30	0.05	0.70	0.00	0.00	0.00	0.00	0.00	9.22	1960	17.92
1961-62	1962	0.20	0.00	2.93	1.12	2.62	19.09	1.43	0.00	0.00	0.00	0.00	0.00	27.39	1961	6.30
1962-63	1963	0.00	0.55	0.00	0.00	1.00	6.65	4.15	2.88	0.30	1.14	0.00	0.00	16.67	1962	23.69
1963-64	1964	2.10	1.15	3.69	0.00	1.70	0.00	2.00	2.57	0.10	0.00	0.00	0.00	13.31	1963	23.06
1964-65	1965	0.00	0.87	2.42	5.13	1.15	0.67	2.45	8.37	0.16	0.06	0.00	0.00	21.28	1964	14.79
1965-66	1966	0.21	0.00	11.02	4.17	1.98	1.14	0.11	0.00	0.23	0.00	0.00	0.00	18.86	1965	28.26
1966-67	1967	0.00	0.00	3.70	7.51	6.74	0.48	3.08	4.81	0.00	0.00	0.00	0.00	26.32	1966	14.67
1967-68	1968	0.40	0.00	5.39	1.20	2.01	1.69	4.40	1.04	0.00	0.00	0.00	0.14	16.27	1967	22.10
1968-69	1969	0.00	1.36	0.75	2.27	18.31	10.62	0.54	2.03	0.18	0.09	0.00	0.00	36.15	1968	13.66
1969-70	1970	0.00	0.00	2.55	0.24	3.40	2.57	6.51	0.00	0.00	0.00	0.00	0.00	15.27	1969	34.56
1970-71	1971	0.00	0.06	5.31	5.71	1.32	2.36	0.97	0.62	2.34	0.00	0.00	0.00	18.69	1970	23.56
1971-72	1972	0.00	0.15	0.62	7.81	0.70	0.00	0.00	0.19	0.00	0.12	0.00	0.00	9.59	1971	16.19
1972-73	1973	0.00	0.25	5.24	0.99	6.94	11.75	3.42	0.06	0.23	0.05	0.00	0.14	29.07	1972	7.49
1973-74	1974	0.00	0.64	3.14	1.34	9.79	0.16	4.74	0.28	0.00	0.00	0.00	0.00	20.09	1973	27.71
1974-75	1975	0.00	1.00	0.15	8.67	0.00	4.62	4.70	1.29	0.00	0.00	0.00	0.00	20.43	1974	24.79
1975-76	1976	0.16	0.20	0.11	0.31	0.00	7.40	2.59	1.01	0.03	0.26	0.00	0.00	12.07	1975	11.39
1976-77	1977	6.35	0.00	0.51	0.82	4.33	0.26	1.90	0.00	4.39	0.12	0.00	0.68	19.36	1976	18.97
1977-78	1978	0.00	0.00	0.30	7.40	9.91	10.81	12.79	2.74	0.00	0.10	0.00	0.09	44.14	1977	19.38
1978-79	1979	1.55	0.10	2.03	2.41	3.63	5.68	8.56	0.00	0.09	0.00	0.00	0.18	24.23	1978	42.53
1979-80	1980	0.80	0.73	0.73	1.38	7.62	13.14	4.13	0.85	0.21	0.00	0.05	0.00	29.64	1979	21.78
1980-81	1981	0.03	0.00	0.00	1.21	3.19	2.24	6.38	0.91	0.00	0.00	0.00	0.00	13.96	1980	27.24
1991-82	1982	0.56	0.00	2.08	1.00	3.47	0.62	6.23	3.03	0.15	0.12	0.00	0.00	17.26	1981	16.36
1982-83	1983	1.47	0.65	6.22	3.49	9.98	7.05	8.44	4.19	0.35	0.20	0.00	1.84	43.88	1982	25.45
1983-84	1984	1.09	4.41	3.94	3.71	0.04	0.00	0.39	0.27	0.29	0.00	0.00	0.65	14.79	1983	45.20
1984-85	1985	0.62	0.51	2.86	5.67	1.68	2.09	1.69	0.14	0.00	0.00	0.00	0.00	15.26	1984	11.30
1985-86	1986	0.08	0.73	5.03	0.98	2.35	8.61	6.20	1.80	0.00	0.00	0.00	0.00	25.78	1985	12.42
1986-87	1987	1.61	0.00	1.41	0.41	2.33	2.54	3.54	0.15	0.00	0.00	0.00	0.00	11.99	1986	22.39
1987-88	1988	0.00	1.52	1.92	3.92	2.90	2.72	0.60	3.76	0.00	0.00	0.00	0.00	17.34	1987	15.92
1988-89	1989	0.10	0.00	1.18	3.28	0.50	3.58	0.60	0.78	0.25	0.00	0.00	0.00	10.27	1988	14.54
1989-90	1990	0.08	1.07	0.47	0.00	3.13	3.04	0.16	0.10	0.88	0.00	0.00	0.00	8.93	1989	7.33
1990-91	1991	0.06	0.00	0.32	0.06	1.79	2.55	14.92	0.04	0.00	0.30	0.02	0.05	20.11	1990	7.75
1991-92	1992	0.00	0.62	0.21	5.63	3.10	10.46	4.46	0.00	0.34	0.10	0.47	0.00	25.39	1991	26.13
1992-93	1993	0.00	1.94	0.00	6.18	13.88	8.56	5.84	0.00	0.10	0.87	0.08	0.00	37.45	1992	27.05
1993-94	1994	0.00	0.10	1.54	1.65	1.09	6.51	2.32	0.73	0.40	0.00	0.00	0.00	14.34	1993	32.62
1994-95	1995	0.47	0.45	1.78	1.27	21.42	1.92	12.22	0.39	0.98	0.69	0.00	0.00	41.59	1994	15.02
1995-96	1996	0.00	0.00	0.24	3.49	2.27	9.54	2.31	1.28	0.42	0.00	0.00	0.00	19.55	1995	41.35
1996-97	1997	0.00	3.03	0.00	7.01	7.83	0.10	0.00	0.00	0.00	0.10	0.00	0.00	18.07	1996	25.86
1997-98	1998	0.00	0.09	3.22	8.64	4.97	23.55	4.16	2.38	4.31	0.16	0.00	0.00	51.48	1997	19.98
1998-99	1999	0.12	0.00	0.75	0.95	2.26	0.86	3.16	1.87	0.00	0.02	0.00	0.00	9.99	1998	41.35
1999-00	2000	0.02	0.00	0.72	0.00	1.43	8.66	2.74	3.90	0.00	0.00	0.00	0.00	17.47	1999	8.91
2000-01	2001	0.00	2.18	0.00	0.08	6.30	5.24	4.73	1.67	0.18	0.02	0.03	0.00	20.43	2000	18.99
2001-02	2002	0.04	0.49	3.75	1.78	0.59	0.31	0.37	0.11	0.14	0.01	0.05	0.02	7.66	2001	24.23
2002-03	2003	0.20	0.01	5.88	4.59	0.09	2.91	4.46	1.90	1.72	0.19	0.02	0.00	21.97	2002	12.28
2003-04	2004	0.04	0.09	1.31	1.89	0.42	5.18	0.57	0.01	0.02	0.01	0.03	0.00	9.57	2003	14.62
2004-05	2005	0.00	4.46	0.10	8.62	11.20	7.41	3.96	0.74	1.01	0.02	0.00	0.04	37.56	2004	19.42
2005-06	2006	0.20	1.08	0.82	0.72	2.82	2.88	3.26	5.88	0.90	0.00	0.00	0.02	18.58	2005	27.20
2006-07	2007	0.01	0.09	0.26	0.72	3.24	1.86	0.18	0.70	0.00	0.02	0.01	0.02	7.11	2006	16.84
2007-08	2008	0.28	0.28	0.02	3.06	12.00	1.75	0.00	0.08	0.04	0.00	0.00	0.00	17.51	2007	9.67
2008-09	2009	0.03	0.06	2.71	2.55	0.63	6.18	0.78	0.15	0.03	0.07	0.00	0.00	13.19	2008	19.22
2009-10	2010	0.06	3.61	0.01	2.86	6.15	3.84	0.56	1.79					18.88	2009	14.38
													25 yr	19.94		19.82
													30 yr	20.60		20.70
													50 yr	20.56		20.68