

on the monitoring results, the flow-weighted average TDS content of the mining export has ranged from 490 mg/L to 550 mg/L between 1992 and 1998.

Applied Irrigation

Urban and agricultural irrigation are monitored separately. The quality of the urban irrigation water is determined by flow-weighting the average of SWP water quality, groundwater quality, and recycled water quality on an annual basis. Agricultural irrigation water quality is determined by flow-weighting the average qualities of the SWP and groundwater components.

4.4 Groundwater

Zone 7 operates a groundwater monitoring program that collects groundwater level and quality data from approximately 200 “program” wells annually. The data is stored in a computerized database for ready retrieval and reporting. A map showing the location of the program wells in the groundwater monitoring program is presented in Figure 4.3. The current Zone 7 groundwater monitoring program and future monitoring plans with respect to the Salt Management Plan are discussed in Chapter 6, Watershed Salt Management Monitoring Program.

In addition to data from the program wells, Zone 7 has compiled a computerized database of historic water level and mineral quality data from other wells within the local watershed. In general, laboratory analyses for most well samples include Ca, Mg, Na, K, HCO₃, SO₄, Cl, NO₃, SiO₂, alkalinity, boron (B), electrical conductivity (EC), pH, TDS, and hardness. In the late 1990’s arsenic (As) and manganese (Mn) were added to the list of analytes.

Table 4.3 contains representative summaries of the groundwater quality data collected in each of the main subbasins during 1997. Figure 4.3 shows the locations of the wells with their numbers as listed in Table 4.3. A copy of the 1996 water year groundwater monitoring program annual report is included as Reference F.

Figures 4.4 and 4.5 show the contours of average TDS concentrations in the upper and lower aquifers of the main and fringe basins from the 1990 through 1995 water years. The upper aquifer contour map was created primarily using data from wells having a total depth of 150 feet or less, whereas the lower aquifer contour map uses water quality data from deeper aquifer monitoring wells and the municipal supply wells.

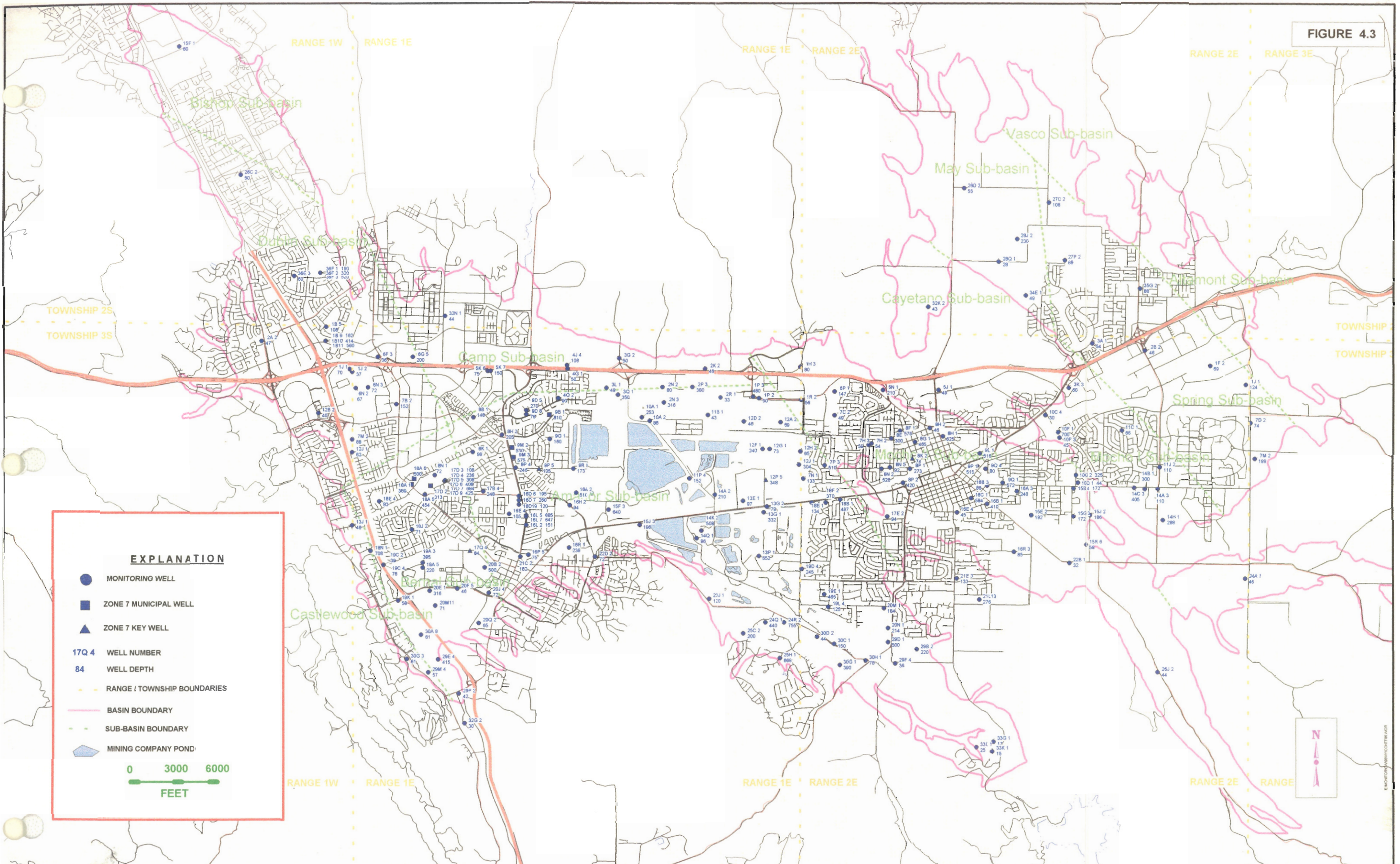
Graphical map-based summaries of the TDS, chloride, hardness, and nitrate concentrations measured in 1997 in the program wells are provided in Figures 4.6, 4.6A, 4.7 and 4.8, respectively. On this series of figures, the size (area) of each symbol (circle or square) is proportional to the concentration of the respective constituent. Larger symbols

ZONE 7
WATER RESOURCES ENGINEERING
GROUNDWATER QUALITY BY BASIN
MAJOR MINERAL SUMMARY
1997 WATER YEAR

SUB-BASIN	WELL	DATE	DTW	TEMP.	EC	pH	Ca	Mg	Na	K	HCO3	SO4	Cl	NO3	SiO2	HARD	B	F	As	Mn	TDS	%Na	LAB
AMADOR EAST SUB-BASIN: LOWER	3S/E 14A 2	08/12/97	102	22.2	608	7.8	63	30	32	1	234	16	82	7	20	281	0.3	0.1	0	0	369	20	ZONE 7
AMADOR EAST SUB-BASIN: UPPER	3S/E 11B 1	09/01/97			1630		58	55	200	1	448	120	255	31	33	374	4.6				1110	54	LWRP
AMADOR WEST SUB-BASIN: LOWER	3S/E 9M 3	06/04/97			650	7.9	49	37	30	2	270	32	41	11	21	274	0.3	0.1	0	0	357	19	ZONE 7
AMADOR WEST SUB-BASIN: UPPER	3S/E 16P 5	05/29/97	38	17.3	620		37	28	43	2	197	58	52	7	12	206	0.3	0.1			336	31	ZONE 7
BERNAL SUB-BASIN: LOWER	3S/E 18A 6	06/04/97			1005	7.8	76	43	79	2	381	90	80	9	26	364	0.5	0.1	0	0	594	32	ZONE 7
BERNAL SUB-BASIN: UPPER	3S/E 19C 4	07/01/97	34.1	17.4	1130	7.1	137	40	47	2	428	126	90	16	20	507	0.3	0.2			690	17	ZONE 7
CAMP SUB-BASIN	2S/E 32N 1	07/03/97	23.4	20.6	1299	7.1	134	11	115	2	318	24	228	31	28	379	0.5	0.2			729	40	ZONE 7
DUBLIN SUB-BASIN: LOWER	2S/W 36F 2	01/28/97	26	18.5	882	7.6	41	11	147	1	387	0	88	0	21	147	0.6	0.1	0.11	0.15	501	69	ZONE 7
DUBLIN SUB-BASIN: UPPER	2S/W 36E 3	07/09/97	4.3	21	861		118	10	48	1	336	88	63	19	38	333	0.2	0.3			550	24	ZONE 7
MAY SUB-BASIN: UPPER	2S/E 28Q 1	06/26/97	4.2	19.1	1550	7.5	60	34	221	1	323	100	249	12	37	290	0.9	0.6			874	53	ZONE 7
MOCHOZ SUB-BASIN: LOWER	3S/E 8 E1	08/08/97	43.8	24	780	8.2	47	55	40		337		56	17		343	20				460	20	DWR
MOCHOZ SUB-BASIN: UPPER	3S/E 1H 3	07/10/97	27.7	20	1412	7.2	70	31	228	2	538	98	189	29	30	302	1	0.4			943	62	ZONE 7
SPRING SUB-BASIN: UPPER	2S/E 27P 2	06/26/97	1	22.1	4620	7.6	111	47	965	3	204	0	1731	5	27	473	33.1	0.5			2990	82	ZONE 7

VALUES IN MG/L
TEMPERATURE IS DEGREES CELSIUS
DTW IS DEPTH TO WATER IN FEET

FIGURE 4.3



ZONE 7 WATER AGENCY
5997 PARKSIDE DRIVE PLEASANTON CA 94588

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CHECKED BY:
APPROVED BY:

WATER RESOURCES ENGINEERING
MONITORING WELL PROGRAM NETWORK
1997 WATER YEAR

SCALE: 1" = 6000' (ON ORIGINAL)
DATE: 15 JANUARY 1997
FILE NO.: H:\SMP\FIG4-1.WOR

FIGURE 4.4

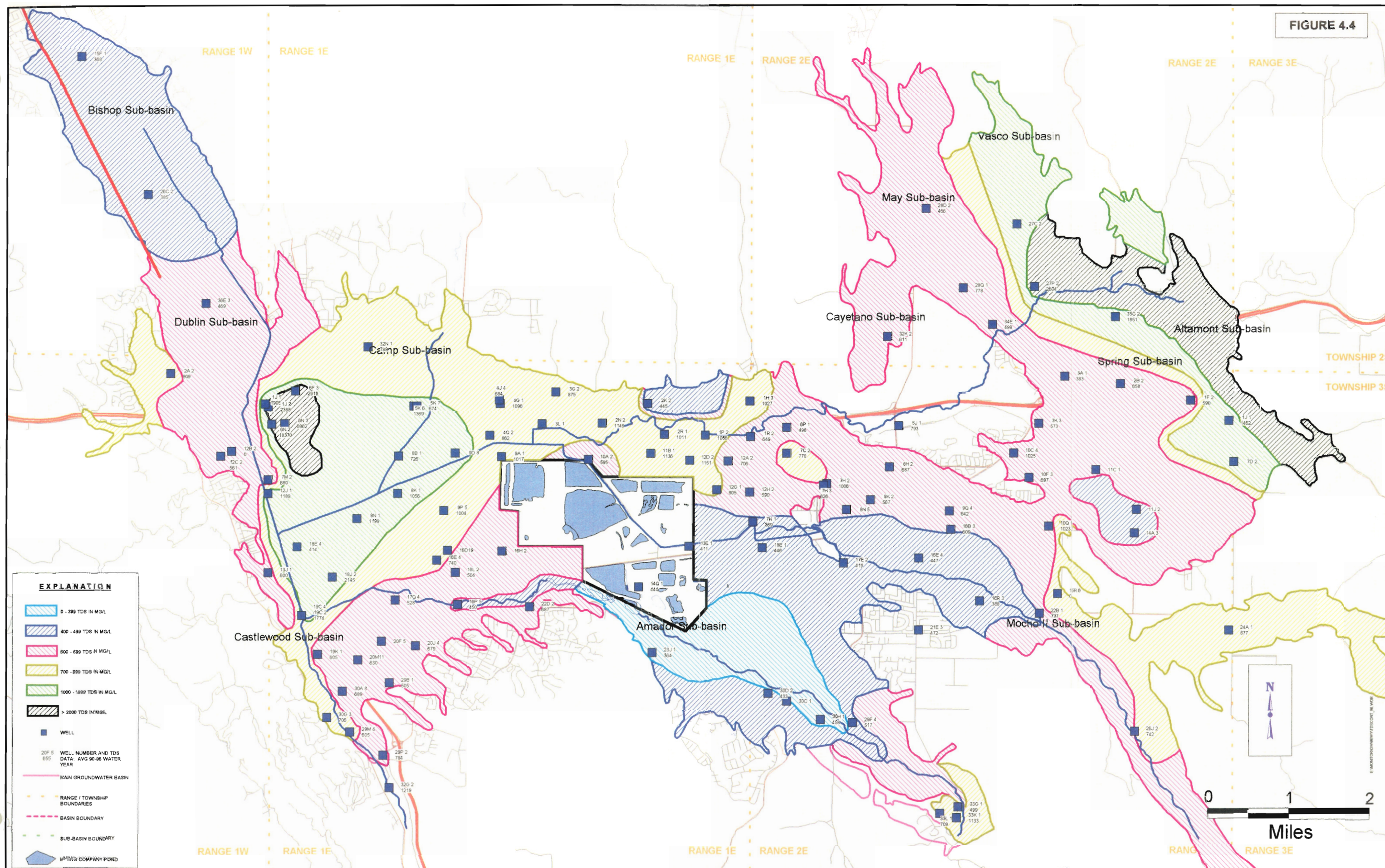
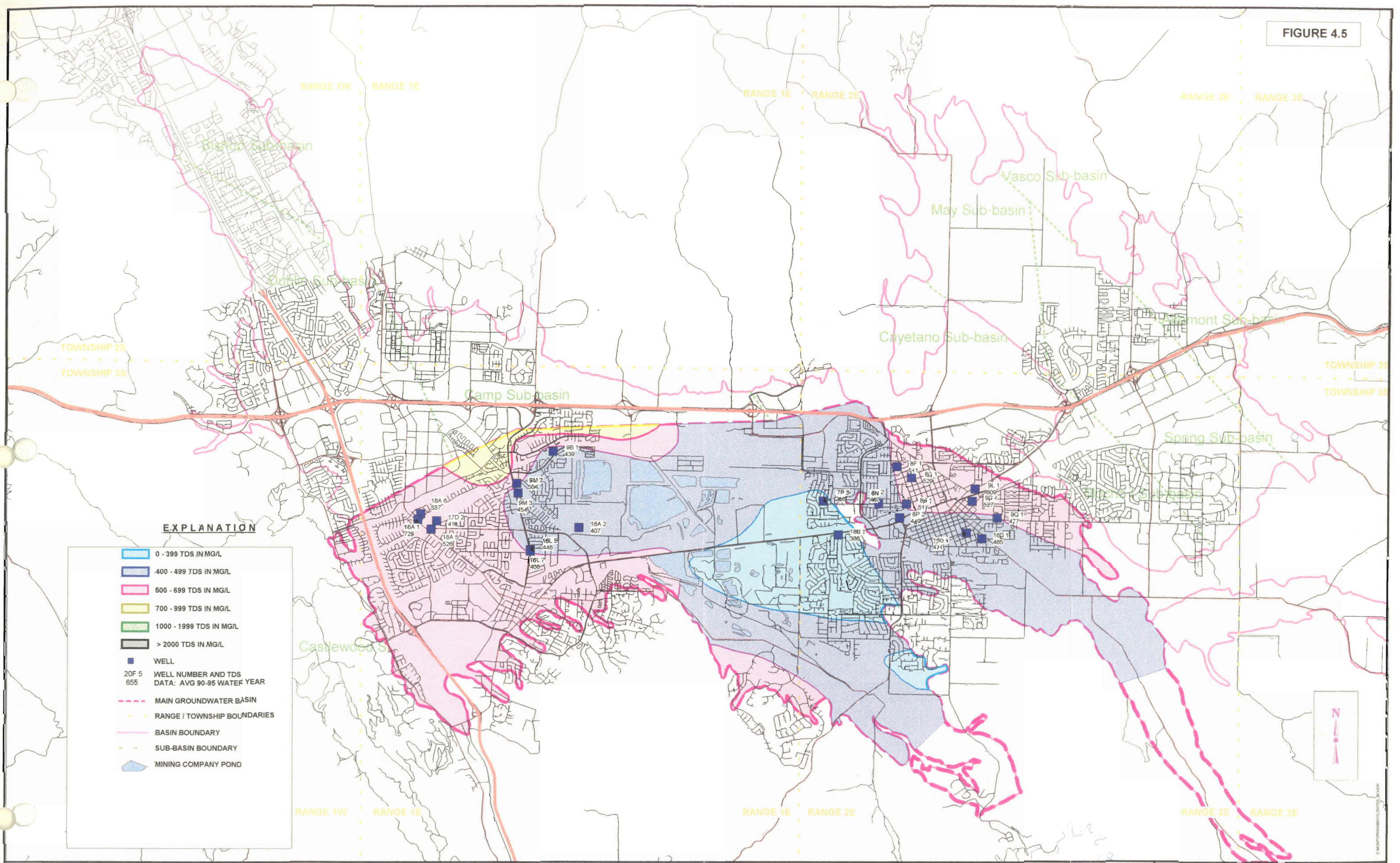


FIGURE 4.5



EXPLANATION

- 0 - 399 TDS IN MG/L
- 400 - 499 TDS IN MG/L
- 500 - 699 TDS IN MG/L
- 700 - 999 TDS IN MG/L
- 1000 - 1999 TDS IN MG/L
- > 2000 TDS IN MG/L
- WELL
- 20F 5
655 WELL NUMBER AND TDS DATA: AVG 90-95 WATER YEAR
- MAIN GROUNDWATER BASIN
- RANGE / TOWNSHIP BOUNDARIES
- BASIN BOUNDARY
- SUB-BASIN BOUNDARY
- MINING COMPANY POND