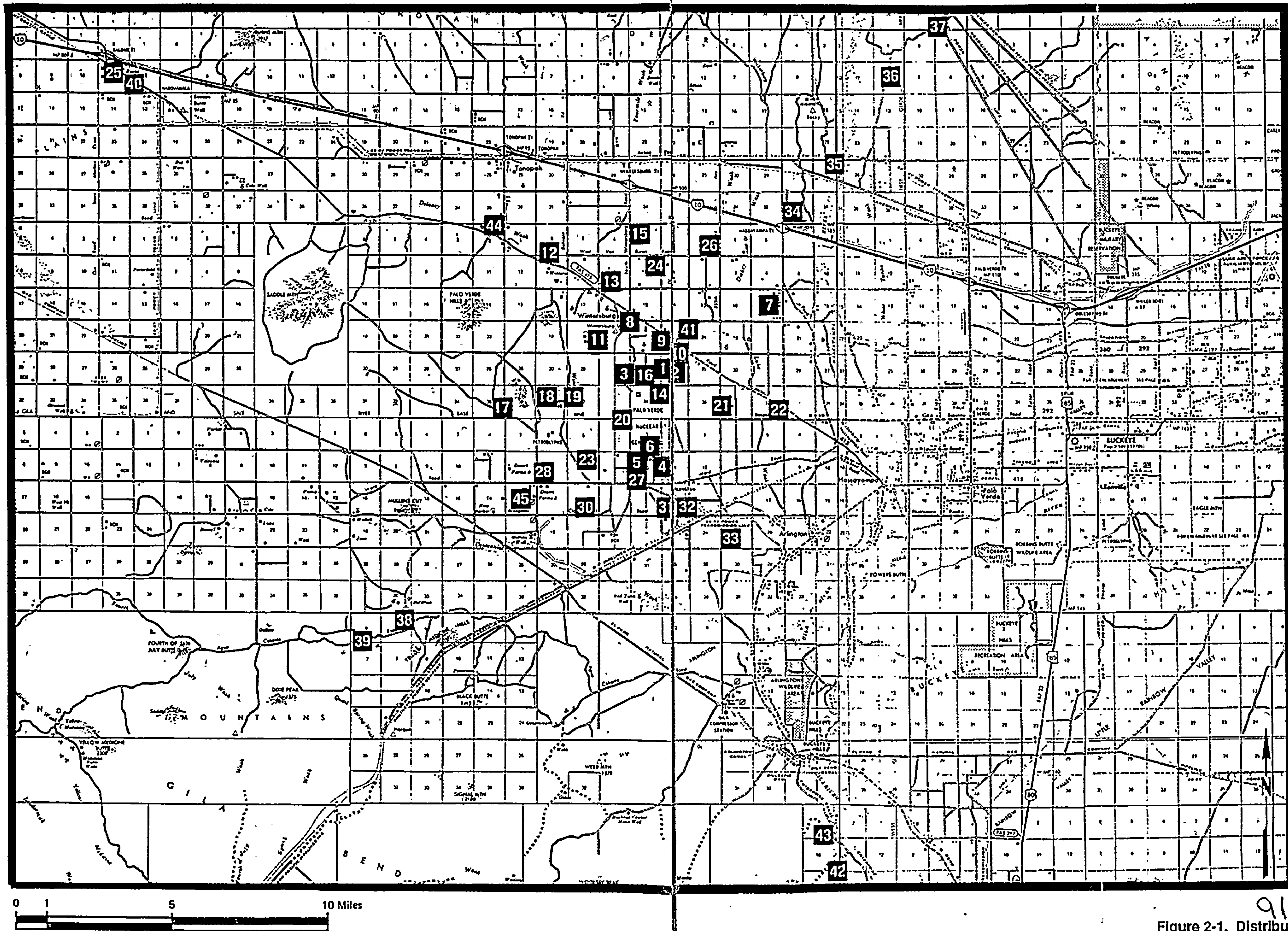

Figure 2-1. Distribution of PVNGS drift deposition and soil sampling locations

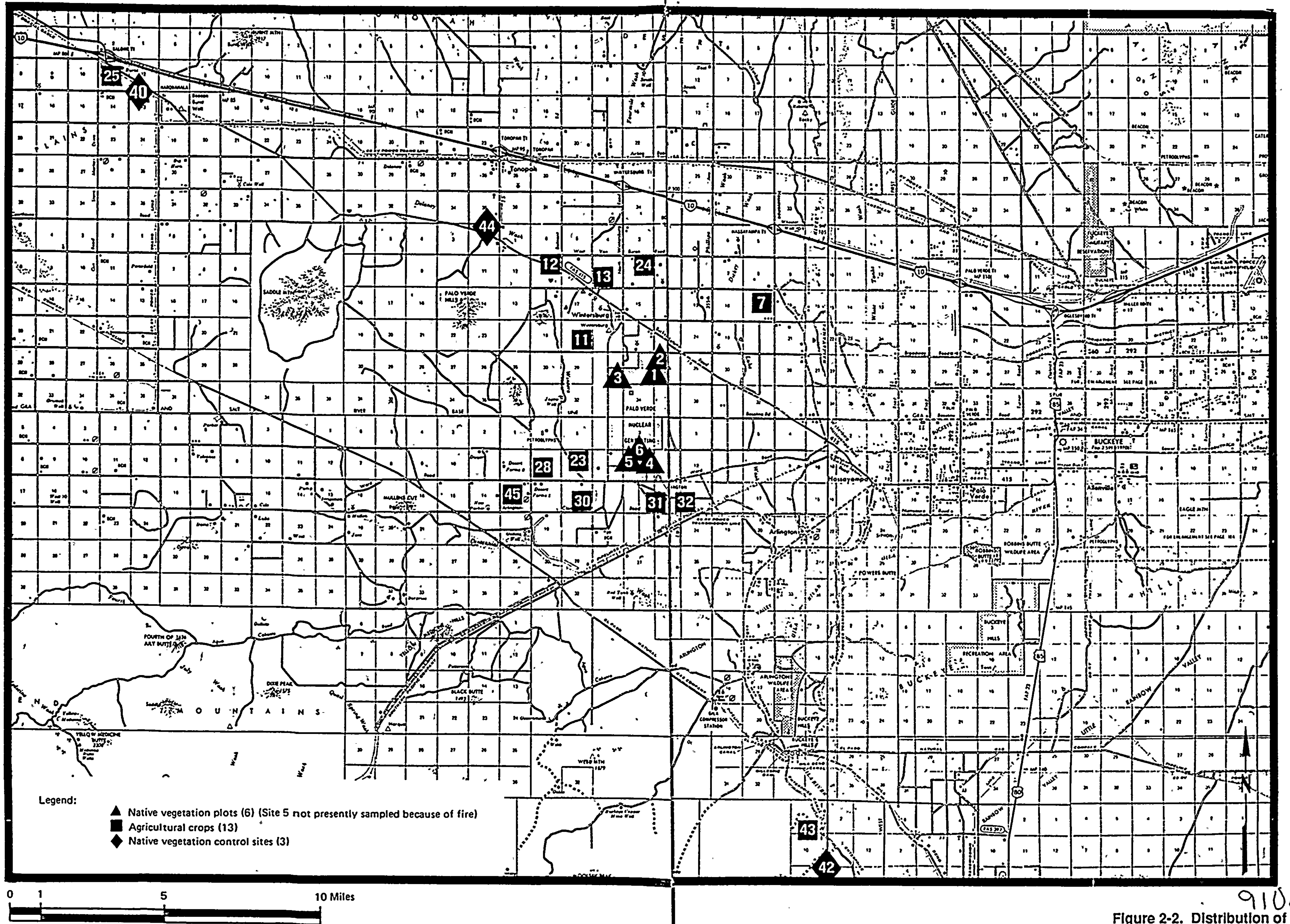

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Figure 2-2. Distribution of PVNGS vegetation sampling locations

3 Climatological Summary

3.1 GENERAL CLIMATOLOGY

The PVNGS site is in southwestern Arizona approximately 50 miles west-southwest of the Phoenix National Weather Service Station (NWS Phoenix) at Sky Harbor International Airport. The site area is part of the Inter-Mountain Plateau Climatic Zone, the driest region of the United States (Baldwin, 1973). This large, arid region is typified by abundant sunshine, infrequent precipitation, low relative humidities, large diurnal temperature ranges, moderate wind speeds, and an occasional intense summer thunderstorm (NOAA, 1984). The summers are hot and the winters are mild. A more detailed description of the climatology of the PVNGS site is provided in the ER-OL (PVNGS, 1979, Section 2.3).

3.2 METEOROLOGICAL SUMMARY

Presented in Table 3-1 are monthly averages of temperature, dew point, wind speed, and monthly totals of precipitation for the PVNGS site and NWS Phoenix for 1990. The PVNGS data on temperature and dew point compare reasonably well with those for NWS Phoenix. They show, for example, that NWS Phoenix in 1990 was about 4°F warmer than the PVNGS site and that this difference is partly due to differences in measurement height. They also indicate, however, that in 1990 NWS Phoenix received 50 percent (2.58 inches) more precipitation than PVNGS. This variation in annual precipitation is likely attributable to the highly variable and localized convective storms. Table 3-2 lists the number of days each month in 1990 when precipitation was recorded at the PVNGS site and NWS Phoenix.. Most of the precipitation occurred in the summer, fall, and winter; dry periods occurred primarily in the spring.

Comparisons of 1990 data and long-term averages for both PVNGS and NWS Phoenix are presented in Section 9.1.

Monthly, quarterly, and annual wind roses for the 35- and 200-foot levels of the meteorological tower at PVNGS for 1990 are presented as Figures 3-1 through 3-7. As seen in Figure 3-7, annual average wind directions for both

levels are similar in that they reflect peak frequencies for winds from the southwest. However, a secondary peak from the north is evident only for the 35-foot level. This secondary peak is a reflection of the nighttime cold air drainage flow from the higher terrain just north of the PVNGS site. The highest average wind speeds at the 35-foot level are for winds from the east. The highest average wind speeds at the 200-foot level are for winds from the southwest, but there is a secondary peak for winds from the east. Also presented on the wind roses is the frequency of calm winds, 0.03 and 0.02 percent for the 35- and 200-foot levels, respectively, for the year. The quarterly wind roses (Figures 3-5 and 3-6) reflect a similarity between the first and fourth quarters with respect to the drainage effect at the 35-foot level. Lighter wind speeds, lower temperatures, and a high occurrence of stable conditions produce a higher frequency of nighttime cold air drainage flow during these quarters. The second and third quarter wind roses for both the 35- and 200-foot levels show peak frequencies for winds from the southwest.

Table 3-3 shows the occurrence of wind gusts in excess of 50 miles per hour at the 35- and 200-foot levels at PVNGS for 1990. Most of the occurrences were in the summer months and were associated with thunderstorm activity in and around the PVNGS area.

Table 3-4 presents monthly distributions of atmospheric stability classes for PVNGS for 1990 based on the delta T (i.e., the difference between the temperature at 200 feet and that at 35 feet). The distributions show that stable classes (E, F, and G) dominated throughout the year. The unstable classes (A, B, and C) have a higher frequency of occurrence in the spring and summer months. Analyses of PVNGS meteorological data since 1974 reveal that this is a normal pattern for the PVNGS site area. A more detailed description of the meteorological conditions at PVNGS during 1990 is presented in NUS-5339 (NUS, 1991a).

3.3 METEOROLOGICAL DATA RECOVERY

PVNGS meteorological data recovery for 1990 is indicated in Table 3-5. Annual data recovery for each parameter was greater than 99 percent, and at no time did monthly data recovery for any parameter drop below 97 percent.

These high recovery rates are attributable in part to the upgraded meteorological system installed at PVNGS in mid-October 1985 and in part to limited hours of power outages.

Table 3-1. Monthly averages of meteorological data for PVNGS and NWS Phoenix, 1990

Month	Temperature (°F)		Dew point (°F)		Precipitation(in.)*		Wind speed (mph)	
	PVNGS	NWS Phoenix†	PVNGS	NWS Phoenix†	PVNGS	NWS Phoenix†	PVNGS	NWS Phoenix‡
January	51	56	30	31	1.09	0.80	4.7	5.2
February	53	57	27	32	0.11	0.70	6.0	5.9
March	64	67	28	33	0.09	0.35	6.8	6.0
April	73	76	35	41	0.04	0.17	7.6	7.1
May	77	81	30	35	0.04	0.16	7.9	7.4
June	91	94	36	42	0.00	0.04	7.5	7.1
July	91	94	60	63	0.54	1.05	7.8	7.3
August	88	91	56	59	1.92	2.70	7.7	6.4
September	84	88	56	61	0.72	1.11	6.8	5.2
October	74	79	35	40	0.36	0.04	5.4	4.7
November	61	66	27	37	0.00	0.15	5.6	4.7
December	49	54	19	29	0.24	0.46	5.2	5.0
Annual	71	75	37	42	5.15	7.73	6.6	6.0

*Annual precipitation is sum of monthly totals.

†Based on measurement at 5 feet.

‡Based on measurement at 33 feet.

Table 3-2. Number of days with precipitation events of ≥0.01 inch at PVNGS and NWS Phoenix, 1990

Month	PVNGS	NWS Phoenix
January	8	5
February	2	3
March	2	5
April	1	1
May	1	2
June	0	1
July	3	7
August	3	6
September	6	6
October	1	1
November	0	3
December	5	7
Average (month)	2.7	3.9

Table 3-3. Occurrences of wind gusts in excess of 50 miles per hour at PVNGS, 1990

Date	Hour ending	Occurrences during hour	Wind speed level (ft)	Probable cause
3/5	1230	1	200	Gust front *
7/2	0145	4	200	Gust front *
7/10	2200	4†	200	Thunderstorm
7/21	2200	>10	35	Thunderstorm
7/21	2200	>20	200	Thunderstorm
7/22	2400	1	200	Gust front *
7/30	2100	2	35	Thunderstorm
7/30	2100	8	200	Thunderstorm
7/30	2200	5	200	Thunderstorm
8/1	1800	1	35	Gust front *
8/11	1800	4	200	Gust front *
9/3	1600	5	35	Gust front *
9/3	1600	>10	200	Gust front *
9/3	1900	5	200	Gust front *
9/14	2400	8	200	Thunderstorm
11/26	1000	10	200	Gust front *

*Large outflow winds produced by intense thunderstorms within 75 miles of the PVNGS site, but not occurring at the site.

†Number may be higher. Power failure may have compromised detection capability.

Table 3-4. Monthly percent frequency distributions of stability classes based on delta T for PVNGS, 1990

Month	Stability category						
	A	B	C	D	E	F	G
January	0.00	0.67	1.61	28.09	14.78	15.59	39.25
February	1.04	2.23	5.80	27.38	17.71	14.88	30.95
March	4.30	5.78	8.74	22.85	18.68	13.44	26.21
April	7.36	6.81	11.11	23.75	21.81	15.42	13.75
May	13.04	8.47	11.16	15.86	19.76	18.82	12.90
June	10.97	10.42	9.86	19.31	19.44	13.06	16.94
July	6.07	11.74	12.69	30.90	26.72	8.37	3.51
August	3.50	8.08	11.57	28.13	27.19	12.92	8.61
September	1.53	4.44	11.11	26.94	25.56	13.61	16.81
October	0.67	3.23	8.06	23.25	12.50	12.10	40.19
November	0.83	0.83	3.06	27.36	12.78	11.11	44.03
December	0.13	0.13	3.09	26.08	17.61	14.52	38.44
Annual	4.13	5.25	8.17	24.98	19.55	13.65	24.27

Notes:

1. Delta T is defined as difference between temperatures at 200- and 35-foot levels of meteorological tower.
2. Averages are based on joint recovery of stability and 35-foot wind data.

Table 3-5. Percentages of meteorological data recovery for PVNGS, 1990

Month	35-ft wind		200-ft wind		ΔT*	Joint (ΔT and 35-ft wind data)	35-ft dew point	35-ft temperature	Precipitation
	Speed	Direction	Speed	Direction					
January	100	100	100	100	100	100	97	100	100
February	100	100	100	100	100	100	100	100	100
March	100	100	100	100	100	100	100	100	100
April	100	100	100	100	100	100	100	100	100
May	100	100	100	100	100	100	100	100	100
June	100	100	100	100	100	100	100	100	100
July	99	99	99	99	99	99	99	99	99
August	99	99	99	99	99	99	99	99	99
September	100	100	100	100	100	100	100	100	100
October	100	100	100	100	100	100	100	100	100
November	100	100	100	100	100	100	100	100	100
December	100	100	100	100	100	100	100	100	100
Annual	99	99	99	99	99	99	99	99	99

*Difference between temperatures at 200- and 35-foot levels of meteorological tower.

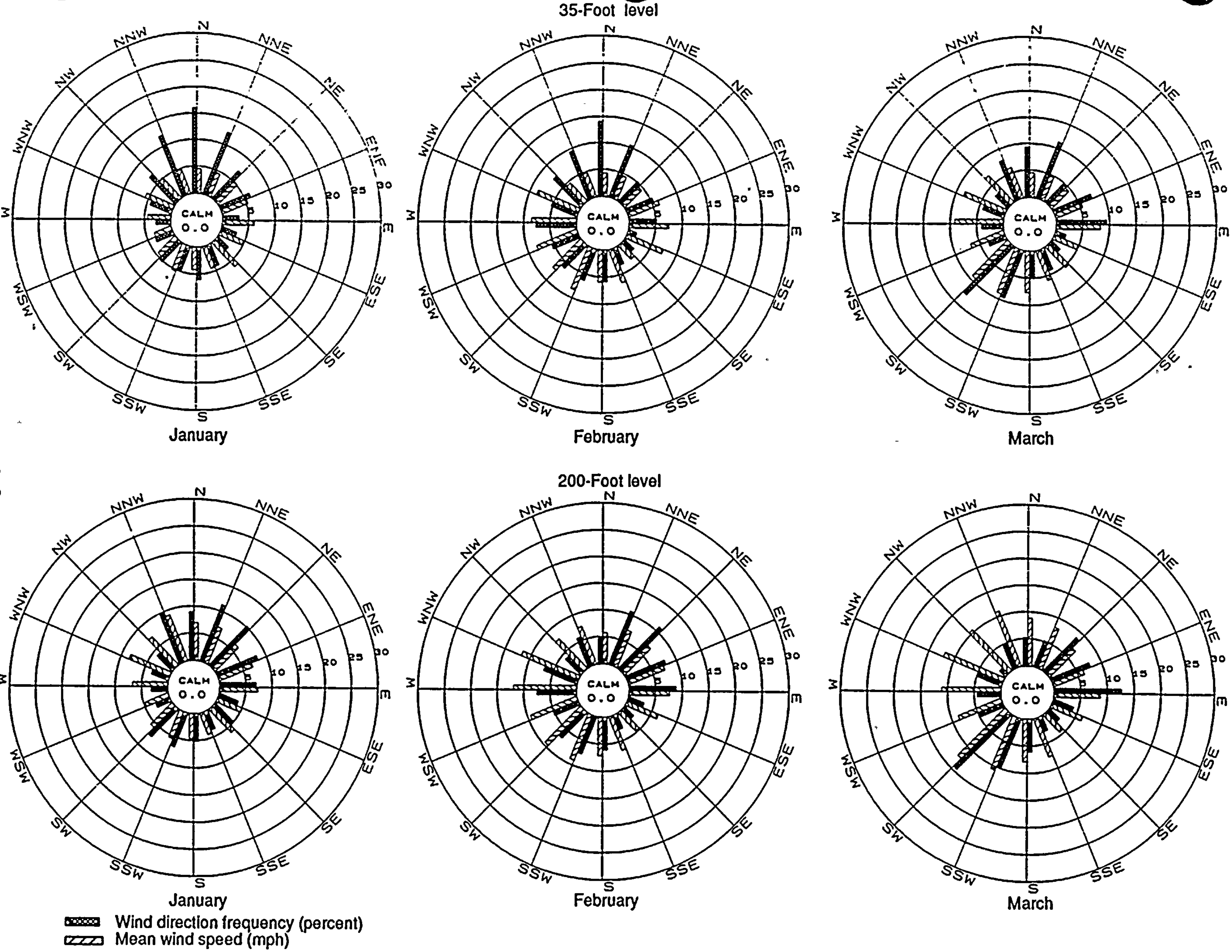


Figure 3-1. Gross wind roses for PVNGS, January, February, and March 1990

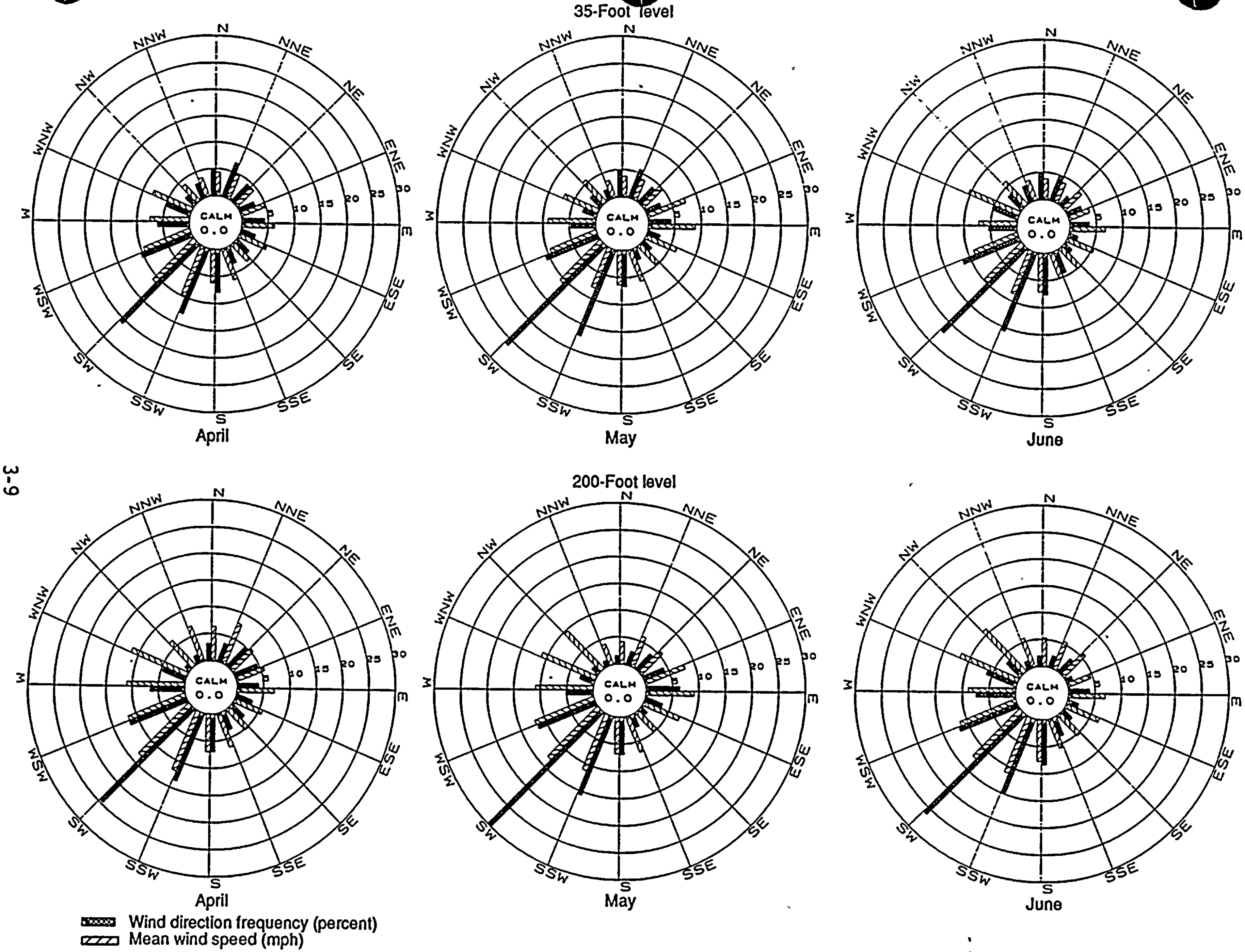


Figure 3-2. Gross wind roses for PVNGS, April, May, and June 1990

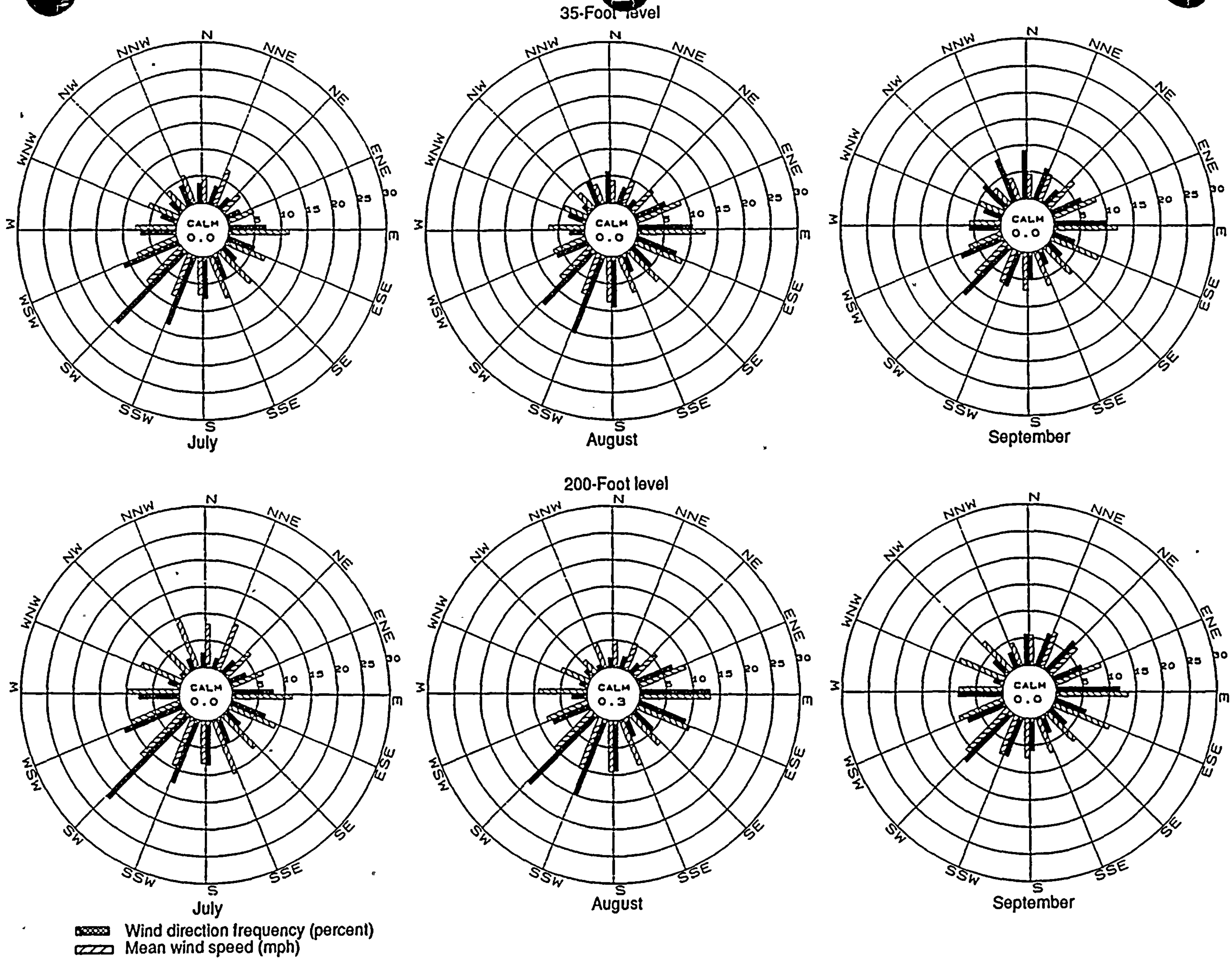


Figure 3-3. Gross wind roses for PVNGS, July, August, and September 1990

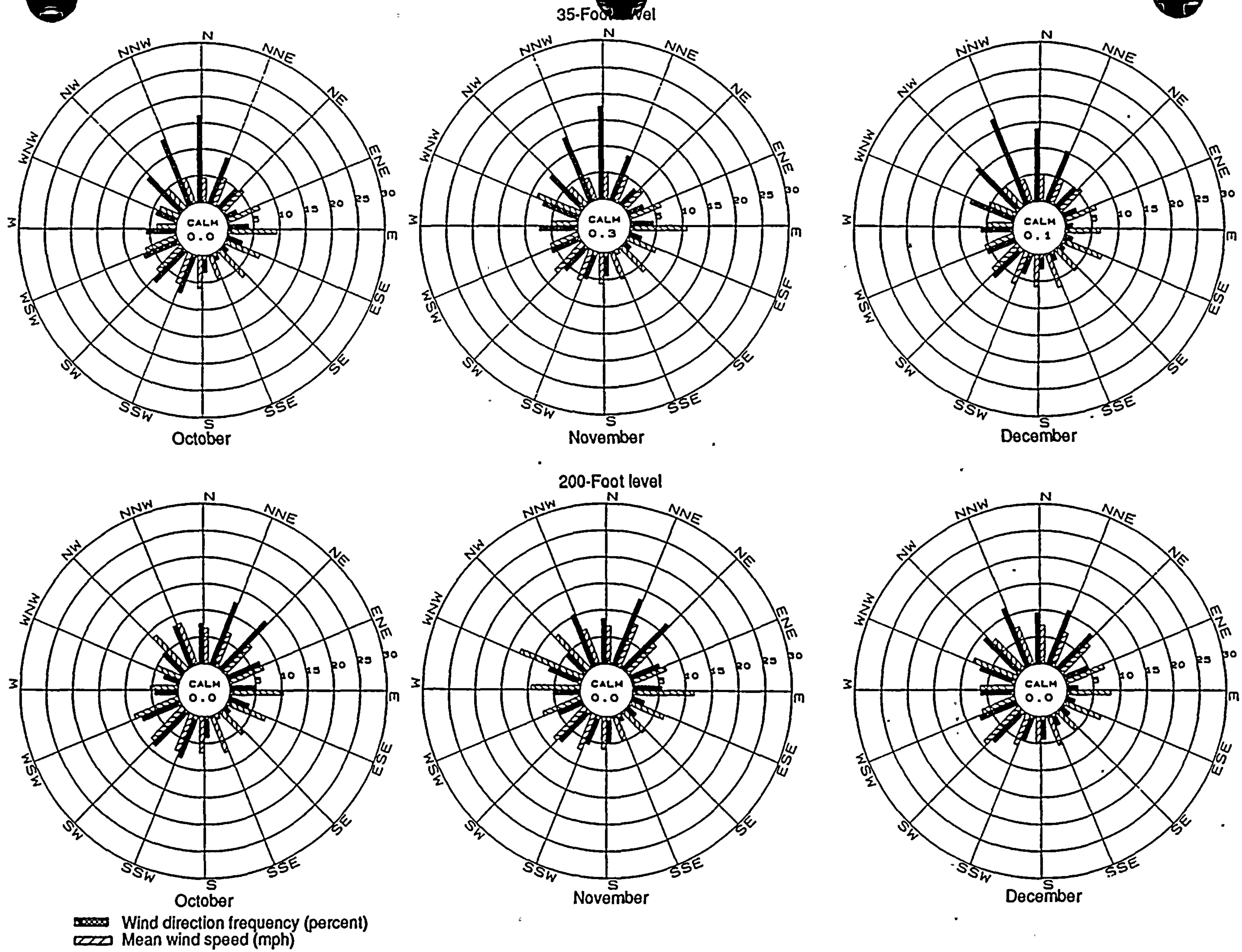


Figure 3-4. Gross wind roses for PVNGS, October, November, and December 1990

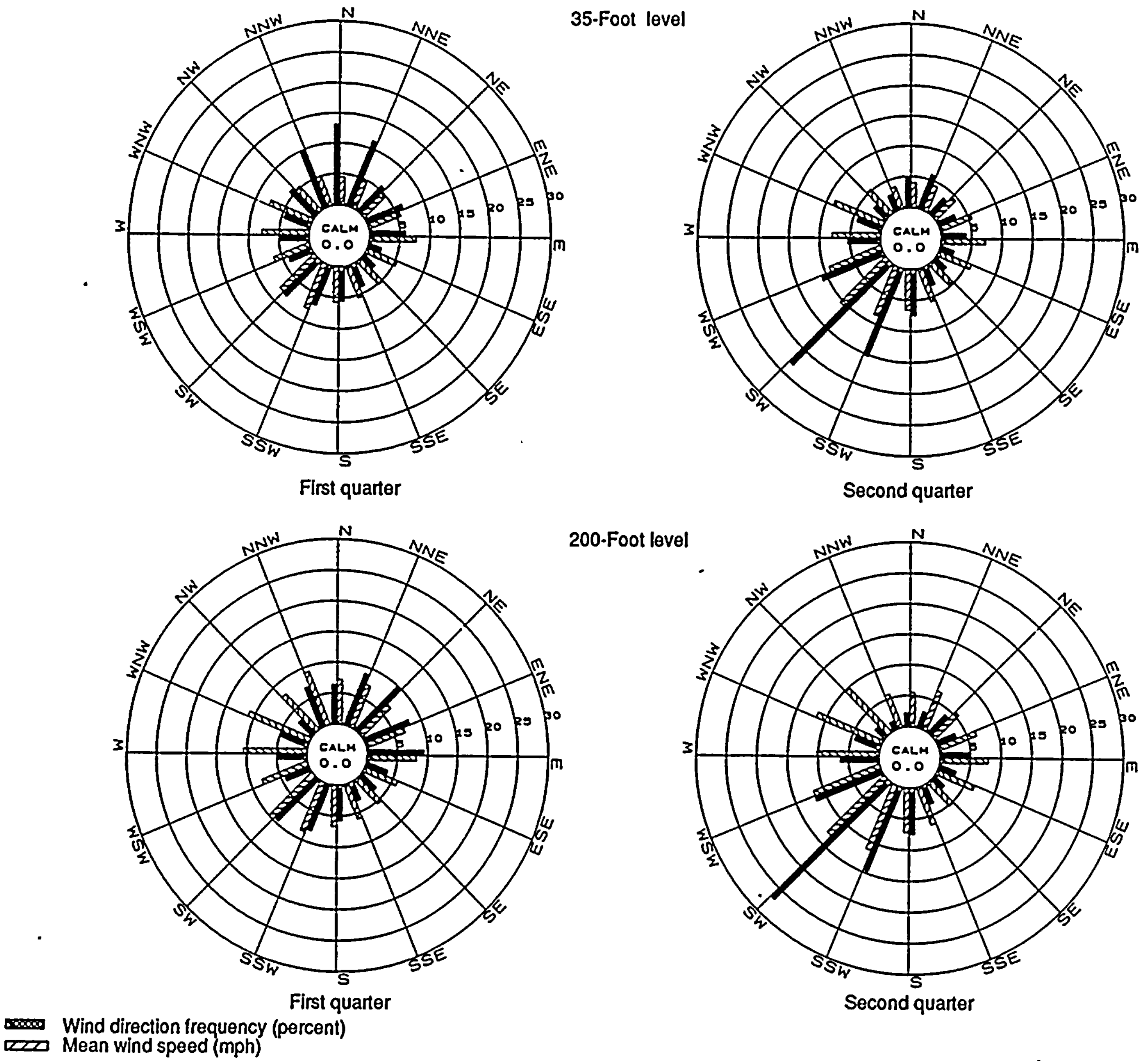
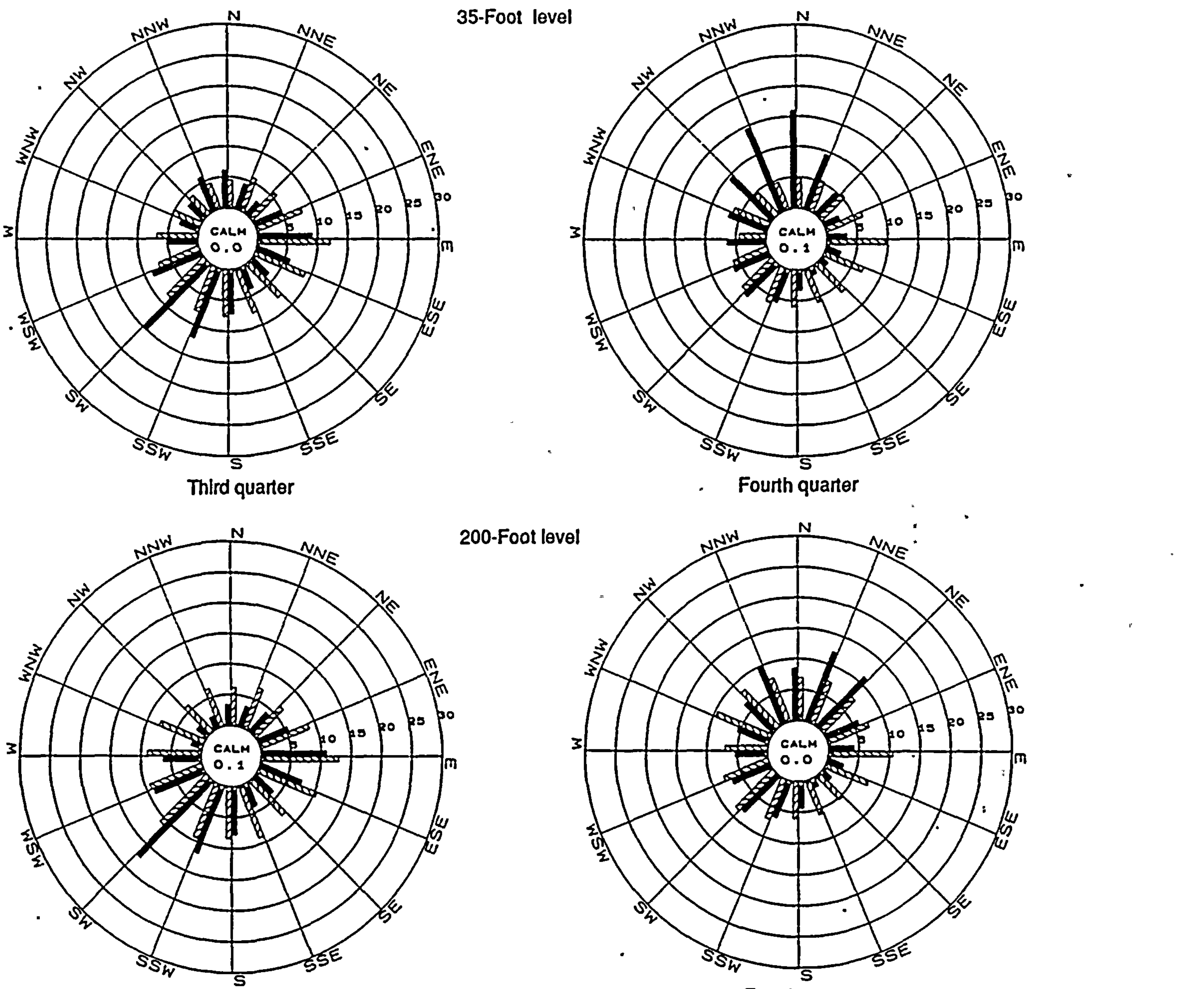


Figure 3-5. Gross wind roses for PVNGS, first and second quarters 1990



Wind direction frequency (percent)
Mean wind speed (mph)

Figure 3-6. Gross wind roses for PVNGS, third and fourth quarters 1990

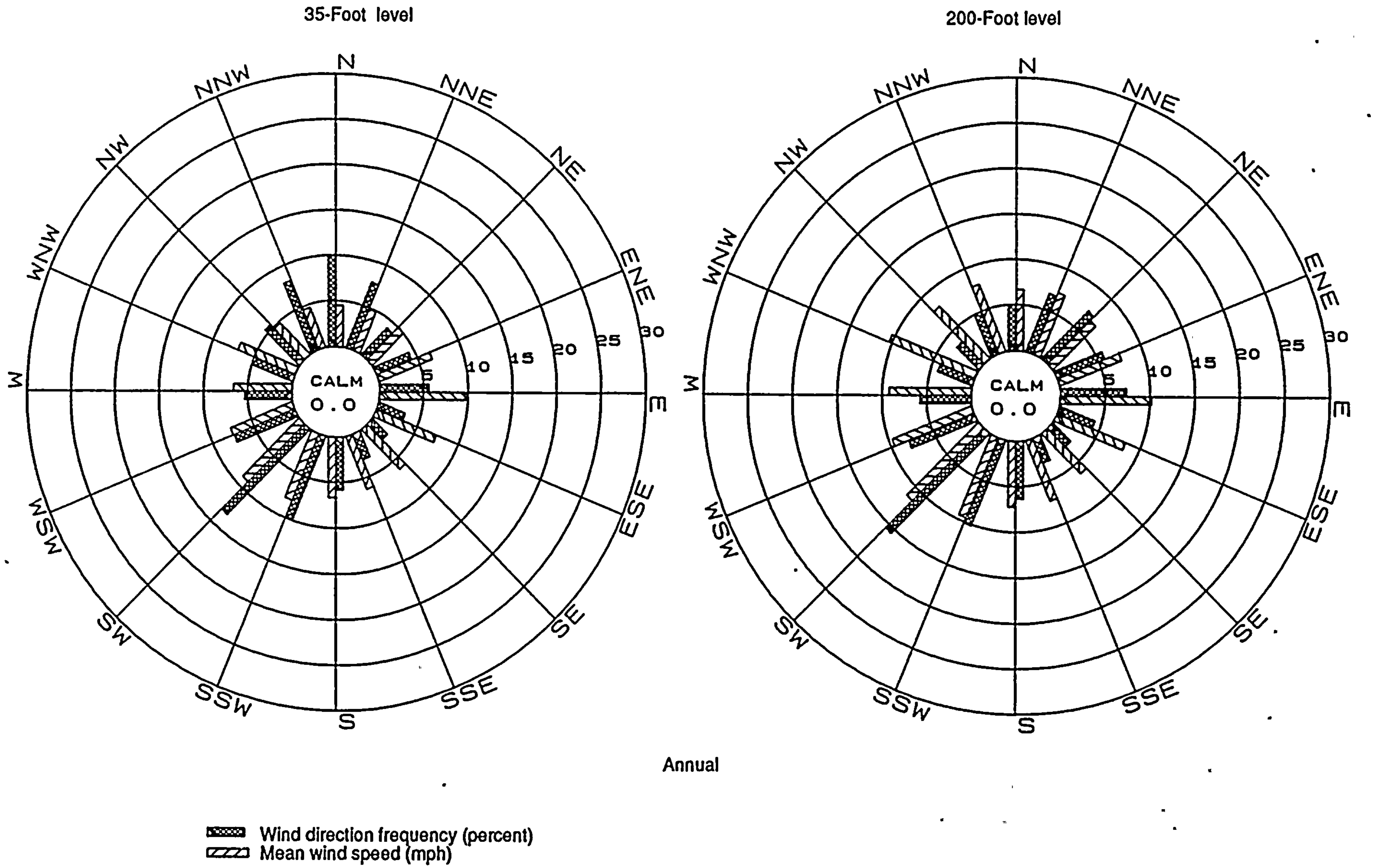


Figure 3-7. Gross annual wind roses for PVNGS, 1990

4 Plant Operation

4.1 COOLING TOWER OPERATION

During 1990, Units 1, 2, and 3 of PVNGS continued commercial operation, although on a limited basis. Operating data for all three units were analyzed to provide estimates of drift emissions from each unit for the year. Such data included the dissolved solids content of the circulating water as indicated by daily conductivity measurements (see Section 4.3), the number of circulating water pumps and the number of cooling tower fans in operation on each shift, and the thermal energy generated per day.

In October, a drift measurement test was performed on the same four cells of cooling tower 1C that were tested in 1983 to determine the current drift emission rate and drop size distribution of the Unit 1 cooling towers (ESC, 1990). The current drift rate at full fan flow was calculated to be 0.00075 percent of the circulating water flow rate based on both sensitive paper and isokinetic sampling. The previous drift rate was calculated to be 0.0002 percent of the circulating water flow rate (ESC, 1983). A physical inspection of the cooling towers during operation of the three units indicated clear differences in the physical condition of Units 1 and 2 which were likely to influence their drift emissions. Accordingly, the recently determined drift rate of 0.00075 percent was applied to the drift emission calculations for Units 1 and 2. The originally determined drift rate of 0.0002 percent was retained for the drift emission calculations for Unit 3. The drift rate under natural draft (no fans in operation) in these towers was assumed to be zero.

Table 4-1 shows the monthly average operating parameters and calculated drift emissions for each unit at PVNGS for 1990. Figure 4-1 presents the thermal energy produced per month by each of the units as well as the average monthly combined drift emission rate from all of the units. This figure indicates the general correspondence of energy generation and drift rate. The daily plant data summaries and the calculated parameters from which the monthly values were derived for this period are presented by month in Appendix A.

4.2 COOLING TOWER BASIN WATER QUALITY

Cooling tower basin water was sampled monthly throughout 1990 for all units operating on the day the samples were collected. Thus, Unit 1 was not sampled in January through June, Unit 2 was not sampled in March through May, and Unit 3 was not sampled in January. Additionally, a sampling of Unit 3 was not performed in April although the unit was operating. The objective of the sampling was to determine the concentration of dissolved solids and selected trace elements in the circulating water.

The results of the individual basin water analyses are presented in Appendix B. A summary of these individual analyses for each of the units is presented in Table 4-2. This table presents, for each analyte, the average of the measured concentrations, the range of values observed over the period, and the coefficient of variation (the standard deviation of the monthly values divided by their mean). For those analytes reported as below the laboratory detection limit, a value equal to one-half the laboratory detection limit is used to calculate the mean. The minimum range value reported represents the laboratory detection limit preceded by a "less than" (<) symbol.

The coefficients of variation, although relatively large for some minor constituents (copper, lead, and selenium in Unit 1; arsenic, ammonium, mercury, selenium, and phenol in Unit 2; phosphate, lead, mercury, and selenium in Unit 3), were generally smaller for the major constituents than they were in 1989. TDS concentrations ranged from 4,200 to 32,000 milligrams per liter over the year; the mean values were 19,000, 15,656, and 18,000 milligrams per liter for Units 1, 2, and 3, respectively.

The annual average concentrations for 10 of the 30 analytes exceeded the average ER-OL values (PVNGS, 1979) for Units 1, 2, or 3. These 10 included sodium, chloride, sulfate, potassium, iron, boron, TDS, barium, mercury, and selenium. Moreover, 12 analytes (the 10 listed above plus calcium and phosphate) exceeded the maximum ER-OL values in one or more months of 1990.

Table 4-2 also presents the annual average ratios of the concentration of sodium to that of potassium, calcium, magnesium, nitrate, chloride, and

sulfate, as well as the coefficients of variation for these ion ratios. For Unit 1, with the exception of the sodium-to-sulfate ratios, the coefficients of variation are generally equal to those for the individual ions. The coefficients of variation of the ratios for Unit 2 are generally smaller than those for the individual ions, indicating a greater consistency in the relationship of these concentrations to one another than in the concentrations themselves. For Unit 3, with the exception of the sodium-to-chloride ratio, the coefficients of variation are generally larger than those for the individual ions.

During 1990, as in previous years, cooling tower makeup water was obtained from treated Phoenix waste water, after treatment by the PVNGS water reclamation plant. The average annual effective concentration factors achieved by the cooling tower operations for Units 1, 2, and 3 in 1990, calculated in reference to an annual mean value for TDS in the reservoir water of 892 milligrams per liter, were determined to be 21.3, 17.6, and 20.2 for Units 1, 2, and 3, respectively.

As in the analysis of 1986 operations, to minimize the influences of water chemistry control and biocide additives on TDS values, the annual average calcium concentration in the reservoir water (57.4 milligrams per liter) was used as a basis for determining effective cooling tower concentration factors. This approach yielded apparent concentration factors relative to the reservoir water of 7.1, 6.6, and 6.9 for Units 1, 2, and 3, respectively.

A third determination of the effective cycles of concentration was made using potassium as a tracer. This element should not be influenced either by water chemistry control additions or by the water reclamation plant processes. With a mean annual value of 16.3 milligrams per liter in the reservoir water, the mean annual concentrations of potassium in the cooling tower basin water (283, 223, and 220 milligrams per liter in Units 1, 2, and 3, respectively) would yield a mean annual concentration factor in the range of 13.5 to 17.4.

Ratios of TDS to conductivity for each unit were determined from cooling tower basin water monthly sample TDS values and mean plant operating data conductivity values measured on the same day. The samples from Units 1, 2, and 3 displayed monthly variation during 1990, ranging from a low of 0.60 in

July to a high of 1.15 in August (for Unit 2 and Unit 3, respectively), as shown in Figure 4-2. Because of this variation, TDS concentrations were determined by applying the Unit 1, Unit 2, and Unit 3 ratios for each month to the monthly mean of daily conductivity measurements for each unit rather than applying an average annual ratio. For those months for which samples or analyses were missing and some operation occurred, the annual mean of all ratio values for each unit (0.77, 0.79, and 0.81 for Units 1, 2, and 3, respectively) was used. These values are indicated in the footnotes to the monthly plant operating data sheets presented in Appendix A.

4.3 DRIFT DEPOSITION MODELING

The NUS computer code FOG was used to calculate the deposition of dissolved salts emitted as drift by the cooling towers of each of the three PVNGS units for the entire year, each quarter, and each month of 1990 when the units and their cooling towers were in operation. PVNGS Unit 1 was not in operation from January through June 1990, and Unit 2 was not in operation from March through June 1990. PVNGS Unit 3 operated in each month of the year. PVNGS Units 1, 2, and 3 were in operation for the entire third and fourth quarters (July through December 1990).

The drop sizes measured in the 1990 test program (ESC, 1990) identified a size distribution spectrum which differs significantly from that determined in the earlier tests (ESC, 1983), as shown in Figure 4-3. Of particular note is the much more significant contribution of large diameter droplets to the total drift mass of droplets in the recent tests than in the original test program, the mass median diameter increasing from about 390μ in the earlier tests to about 1400μ in the recent tests. When distributed into the 16 size classes, or "bins," for use in the NUS-FOG computer model, the results from the two test series appear as presented in Table 4-3. The 1990 drop size distribution was used in conjunction with a drift rate of 0.00075 percent for Units 1 and 2, whereas the previous drop size distribution and drift rate of 0.0002 percent were used for Unit 3, in predicting drift deposition using the NUS-FOG model.

The FOG code used sequential hourly meteorological data for 1990 obtained from the PVNGS meteorological tower system. The deposition calculations were

performed for each unit in operation with daily plant operating data (Appendix A) and hourly onsite meteorological data. The combined drift deposition for Units 1, 2, and 3 was calculated by summing the individual drift contributions from each of these units.

Figures 4-4 and 4-5 reflect the results of this drift deposition modeling for the year in onsite and offsite areas, respectively. As shown in Figure 4-4, the maximum calculated offsite deposition was approximately 75 pounds per acre per year along the site boundary west and southwest of Unit 3. This value resulted primarily from the operation of all three units during the second half of the year (i.e., third and fourth quarters). The general deposition patterns remain unchanged from 1989; however, the area within each isopleth has increased as a result of the near full power operation of the three units after the second quarter, as well as higher drift rate for Units 1 and 2. Therefore, the maximum calculated deposition is higher for 1990 than for 1989.

Figure 4-5 indicates that the maximum drift deposition calculated at an agricultural site in 1990 was about 2 pounds per acre at site 23, about 2.5 miles southwest of the power block. Figures 4-6 through 4-9 present the results of the onsite drift deposition modeling for each quarter of 1990. Although the magnitude of drift deposition varies from quarter to quarter due to limited operation of cooling towers in the first half of the year, the drift deposition patterns remain similar for all quarters.

The predicted monthly and annual drift deposition at each of the onsite monitoring sites is summarized in Table 4-4. The highest predicted monthly deposition occurs in the months of August, September, and October at site 81, 0.2 mile north-northwest of the Unit 2 cooling towers and about the same distance west of those for Unit 1. This deposition pattern is consistent with the predominant wind directions for this season, as depicted in Figures 3-1 through 3-6. Overall, the highest predicted monthly deposition is 1310 pounds per acre at site 81 in August. The isopleths defining the higher deposition rates (100 pounds per acre per quarter and higher) were all in the vicinity of the PVNGS cooling towers. A comparison of the predicted and measured deposition rates for 1990 is presented in Section 9.3.

Table 4-1. Power operation and cooling tower parameters for PVNGS, 1990 (sheet 1 of 2)

	Heat generation		Airflow (m^3/sec)			Circulating water		Calculated drift*	
Month	Btu/min	MWt/d	Tower 1	Tower 2	Tower 3	Flow (gpm)	TDS (ppm)	Gpm	Lb/min
Unit 1									
January	0.00E+00	0	0	0	0	29,000	0	0.000	0.000
February	0.00E+00	0	0	0	0	29,000	0	0.000	0.000
March	0.00E+00	0	0	0	0	29,000	0	0.000	0.000
April	0.00E+00	0	0	0	0	29,000	0	0.000	0.000
May	0.00E+00	0	0	0	0	29,000	0	0.000	0.000
June	0.00E+00	0	0	0	0	29,000	0	0.000	0.000
July	1.61E+08†	67,725	10,012	9,141	7,576	542,333	15,131	3.660	0.503
August	1.79E+08	75,405	8,590	8,556	8,195	548,355	19,707	3.665	0.613
September	1.31E+08	55,095	6,210	6,443	6,063	430,333	20,246	2.682	0.464
October	2.14E+08	90,229	10,128	10,128	9,958	589,000	20,579	4.393	0.754
November	2.14E+08	90,165	10,128	10,065	9,833	589,000	21,023	4.365	0.766
December	2.15E+08	90,745	9,971	10,012	9,543	589,000	17,090	4.293	0.612
Unit 2									
January	2.15E+08	90,518	9,148	9,740	10,128	589,000	15,585	4.219	0.548
February	1.75E+08	73,737	7,845	8,206	8,319	499,000	12,827	3.543	0.386
March	0.00E+00	0	0	0	0	29,000	0	0.000	0.000
April	0.00E+00	0	0	0	0	29,000	0	0.000	0.000
May	0.00E+00	0	0	0	0	29,000	0	0.000	0.000
June	0.00E+00	0	0	0	0	29,000	0	0.000	0.000
July	4.27E+07	18,026	3,750	1,572	3,648	342,118	6,992	0.976	0.082
August	2.03E+08	85,788	9,774	9,665	9,495	567,925	23,411	4.065	0.802
September	2.15E+08	90,826	10,128	10,128	10,128	589,000	19,347	4.418	0.713
October	2.10E+08	88,497	9,481	9,713	10,128	589,000	19,574	4.263	0.696
November	2.15E+08	90,755	9,439	9,544	10,128	589,000	18,809	4.232	0.664
December	2.15E+08	90,637	9,379	8,753	9,400	589,000	17,400	4.003	0.582

Table 4-1. Power operation and cooling tower parameters for PVNGS, 1990 (sheet 2 of 2)

Month	Heat generation		Airflow (m^3/sec)			Circulating water		Calculated drift*	
	Btu/min	MWt/d	Tower 1	Tower 2	Tower 3	Flow (gpm)	TDS (ppm)	Gpm	Lb/min
				Unit 3					
January	3.57E+07	15,079	796	429	1,266	173,516	6,896	0.097	0.008
February	1.94E+08	81,787	6,805	6,782	8,387	589,000	15,365	0.852	0.110
March	2.14E+08	90,138	9,148	8,862	8,882	589,000	14,458	1.043	0.126
April	1.58E+08	66,611	7,533	6,921	7,469	542,333	14,546	0.850	0.104
May	2.13E+08	89,939	9,944	9,372	10,046	589,000	16,446	1.138	0.156
June	2.15E+08	90,778	10,128	9,938	10,128	589,000	17,600	1.171	0.172
July	2.15E+08	90,790	10,128	10,128	10,128	589,000	17,435	1.178	0.171
August	1.97E+08	83,103	9,379	9,366	9,202	589,000	30,484	1.084	0.277
September	2.11E+08	88,985	10,001	10,128	10,107	589,000	20,258	1.172	0.198
October	2.01E+08	84,647	9,536	9,407	9,121	589,000	17,592	1.088	0.163
November	2.15E+08	90,802	10,114	10,121	10,058	589,000	15,118	1.174	0.148
December	2.08E+08	87,930	9,502	9,141	9,032	570,935	13,363	1.053	0.118

*Based on drift rate at full fan flow of 0.00075 percent of circulating water flow for Units 1 and 2 and a drift rate at full fan flow of 0.0002 percent for Unit 3.

†1.61E+08 = 1.61 X 10^8.

Table 4-2. Chemical composition of cooling tower basin water at PVNGS, 1990 (sheet 1 of 3)

Analyte	Average	Range	COV*	Design-basis value (ER-OL Table 3.6-1)
		Unit 1: Concentrations†		
Calcium, total	407	320-500	0.178	420.0
Magnesium, total	22.2	16.0-30.0	0.267	150.0
Sodium, total	5,917	5,000-6,400	0.085	3,375.0
Chloride	6,750	5,900-7,800	0.110	2,400.0
Sulfate (as SO_4)	4,067	3,800-4,400	0.053	2,250.0
Nitrate (as N)	248	180-330	0.218	1,650.0
Silica (as SiO_2)	69	42-94	0.329	150.0
Phosphate	0.83	0.40-1.20	0.359	1.5
Fluoride	20	17-22	0.108	52.5
Potassium, total	283	200-380	0.243	207.0
Copper, total	0.10	0.054-0.270	0.806	0.3
Zinc, total	0.074	0.051-0.100	0.243	1.0
Iron, total	0.89	0.51-2.20	0.728	0.075
Arsenic, total	0.02	0.010-0.050	0.750	0.12
Boron	5.5	5.0-6.1	0.084	0.56
Ammonium (as N)	0.52	0.3-0.9	0.395	75.0
TSS (at 105°C)	44.6	3-68	0.599	150.0
COD	400	250-490	0.211	1,305.0
Alkalinity, total	26	22-29	0.101	1,500.0
TDS (at 180°C)	19,000	18,000-22,000	0.088	12,000.0
Silver, total	0.003	<0.005	N/A	0.05
Barium, total	0.167	0.1-0.2	0.311	0.15
Cadmium, total	0.003	≤0.005	0.333	0.015
Chromium, total	0.030	0.021-0.050	0.367	0.06
Lead, total	0.020	≤0.050	0.800	0.3
Mercury, total	0.0002	0.0001-0.0003	0.411	0.0015
Beryllium, total	0.003	<0.005	N/A	0.3
Selenium, total	0.053	<0.25	0.925	0.015
Manganese, total	0.034	0.015-0.080	0.706	0.75
Phenol	0.006	<0.005-0.011	0.667	0.14
Conductivity (µmhos/cm)	34,000	30,000-40,000	0.104	--
		Unit 1: Ion Ratios		
Sodium/potassium	21.8	--	0.25	--
Sodium/calcium	14.9	--	0.18	--
Sodium/magnesium	280.8	--	0.24	--
Sodium/nitrate	24.8	--	0.24	--
Sodium/chloride	0.88	--	0.13	--
Sodium/sulfate	1.5	--	0.11	--

Table 4-2. Chemical composition of cooling tower basin water at PVNGS, 1990 (sheet 2 of 3)

Analyte	Average	Range	COV*	Design-basis value (ER-OL Table 3.6-1)
		Unit 2: Concentrations†		
Calcium, total	377	140-500	0.358	420.0
Magnesium, total	21.9	7.8-33.0	0.416	150.0
Sodium, total	4,844	1,200-7,100	0.439	3,375.0
Chloride	5,444	1,300-8,200	0.485	2,400.0
Sulfate (as SO_4)	3,389	1,200-4,300	0.358	2,250.0
Nitrate (as N)	220.3	53-320	0.435	1,650.0
Silica (as SiO_2)	64	12-96	0.494	150.0
Phosphate	1.05	0.58-2:30	0.500	1.5
Fluoride	14.4	3.4-21.0	0.527	52.5
Potassium, total	223	61-370	0.514	207.0
Copper, total	0.071	0.044-0.180	0.620	0.3
Zinc, total	0.077	0.049-0.120	0.338	1.0
Iron, total	0.777	0.38-1.50	0.457	0.075
Arsenic, total	0.017	<0.050	0.824	0.12
Boron	4.7	1.6-6.2	0.350	0.56
Ammonium (as N)	0.744	0.2-2.2	0.862	75.0
TSS (at 105°C)	39.1	7-67	0.446	150.0
COD	358.9	100-560	0.420	1,305.0
Alkalinity, total	24.4	<5-38	0.441	1,500.0
TDS (at 180°C)	15,656	4,200-26,000	0.456	12,000.0
Silver, total	0.003	<0.005	N/A	0.05
Barium, total	0.150	<0.1-0.2	0.407	0.15
Cadmium, total	0.003	<0.005	N/A	0.015
Chromium, total	0.027	0.005-0.037	0.333	0.06
Lead, total	0.012	<0.050	0.667	0.3
Mercury, total	0.001	<0.001-0.0094	2.292	0.0015
Beryllium, total	0.003	<0.005	N/A	0.3
Selenium, total	0.046	<0.25	0.891	0.015
Manganese, total	0.030	0.017-0.052	0.400	0.75
Phenol	0.005	<0.005-0.010	0.800	0.14
Conductivity (µmhos/cm)	27,611	6,500-40,000	0.446	--
		Unit 2: Ion Ratios		
Sodium/potassium	22.8	--	0.27	--
Sodium/calcium	12.3	--	0.17	--
Sodium/magnesium	225.4	--	0.37	--
Sodium/nitrate	22.7	--	0.20	--
Sodium/chloride	0.92	--	0.10	--
Sodium/sulfate	1.39	--	0.21	--

Table 4-2. Chemical composition of cooling tower basin water at PVNGS, 1990 (sheet 3 of 3)

Analyte	Average	Range	COV*	Design-basis value (ER-OL Table 3.6-1)
		Unit 3: Concentrations†		
Calcium, total	394	270-470	0.169	420.0
Magnesium, total	23	12.0-35.0	0.299	150.0
Sodium, total	5,220	3,600-6,500	0.159	3,375.0
Chloride	6,040	3,800-8,800	0.260	2,400.0
Sulfate (as SO_4)	3,720	2,800-4,500	0.166	2,250.0
Nitrate (as N)	249	190.0-300.0	0.160	1,650.0
Silica (as SiO_2)	64	29-110	0.392	150.0
Phosphate	1.3	0.52-4.00	0.849	1.5
Fluoride	16.4	12.0-20.0	0.158	52.5
Potassium, total	220	120-300	0.233	207.0
Copper, total	0.078	0.044-0.160	0.436	0.3
Zinc, total	0.048	0.024-0.110	0.542	1.0
Iron, total	0.675	0.43-0.92	0.255	0.075
Arsenic, total	0.016	<0.05	0.750	0.12
Boron	4.86	4.1-5.8	0.108	0.56
Ammonium (as N)	0.51	0.3-1.2	0.535	75.0
TSS (at 105°C)	45.4	29-72	0.318	150.0
COD	370	110-600	0.419	1,305.0
Alkalinity, total	27.7	20-36	0.167	1,500.0
TDS (at 180°C)	18,000	14,000-32,000	0.294	12,000.0
Silver, total	0.003	<0.005	N/A	0.05
Barium, total	0.130	0.1-0.2	0.369	0.15
Cadmium, total	0.003	<0.005	N/A	0.015
Chromium, total	0.027	0.019-0.033	0.148	0.06
Lead, total	0.020	<0.100	0.850	0.3
Mercury, total	0.002	<0.001-0.0091	1.730	0.0015
Beryllium, total	0.003	<0.005	N/A	0.3
Selenium, total	0.039	<0.1	0.872	0.015
Manganese, total	0.026	0.018-0.037	0.308	0.75
Phenol	0.007	<0.005-0.017	0.714	0.14
Conductivity (µmhos/cm)	29,500	20,000-39,000	0.209	–
		Unit 3: Ion Ratios		
Sodium/potassium	25.0	–	0.30	–
Sodium/calcium	13.6	–	0.25	–
Sodium/magnesium	255.4	–	0.44	–
Sodium/nitrate	21.6	–	0.26	–
Sodium/chloride	0.89	–	0.14	–
Sodium/sulfate	1.43	–	0.20	–

Key: COV, coefficient of variation; N/A, not applicable; TSS, total suspended solids; COD, chemical oxygen demand; TDS, total dissolved solids.

*Standard deviation/mean.

†In milligrams per liter except where otherwise indicated.

NOTE: Statistics based on a sample size of 6 for Unit 1, 9 for Unit 2, and 10 for Unit 3.

NOTE: Averages computed using 1/2 the detection limit for values reported below the detection limit.

Table 4-3. Drop size distribution, PVNGS Cooling Tower 1C

	1990 ESC measurement		1983 ESC measurement	
Bin	Mean radii, cm	Mass fraction	Mean radii, cm	Mass fraction
1	0.0015	0.02828	0.00150	0.05000
2	0.0030	0.07036	0.00350	0.08780
3	0.0045	0.04583	0.00625	0.03720
4	0.0080	0.07458	0.009375	0.06460
5	0.01275	0.05786	0.01250	0.06040
6	0.0175	0.05126	0.01475	0.09000
7	0.0225	0.03907	0.01650	0.07000
8	0.0325	0.05270	0.01800	0.08180
9	0.0500	0.05240	0.01950	0.07820
10	0.0650	0.04262	0.02100	0.08000
11	0.0800	0.07973	0.02295	0.09760
12	0.0950	0.06170	0.024625	0.06240
13	0.1050	0.06169	0.02650	0.05640
14	0.1150	0.13025	0.03000	0.04150
15	0.1450	0.05398	0.03500	0.01640
16	0.1750	0.09769	0.05000	0.02570

Table 4-4. Predicted drift deposition at PVNGS onsite monitoring locations, 1990

Site	Monthly deposition (lb/acre)												Annual deposition (lb/(acre)(yr))
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
1	3.13E-01	3.38E-01	2.35E-01	1.79E-01	4.21E-01	2.20E-01	6.80E-01	1.82E+00	8.09E-01	9.76E-01	7.51E-01	7.24E-01	7.56E+00
2	2.82E-01	1.42E-01	1.39E-01	1.50E-01	2.33E-01	2.19E-01	3.98E-01	1.08E+00	5.49E-01	5.61E-01	4.31E-01	6.40E-01	4.89E+00
3	7.83E-01	4.79E-01	2.03E-01	2.09E-01	3.00E-01	4.23E-01	9.30E-01	1.43E+00	9.33E-01	5.12E-01	8.50E-01	1.16E+00	8.21E+00
4	1.01E-01	6.25E-02	3.40E-02	1.03E-02	7.43E-03	5.74E-03	5.95E-01	2.51E-01	7.29E-01	1.48E+00	1.77E+00	1.73E+00	6.77E+00
5	1.54E-01	6.08E-02	6.29E-02	1.70E-02	7.60E-03	2.18E-02	1.95E-02	8.34E-02	1.17E-01	4.49E-01	6.44E-01	4.75E-01	2.17E+00
6	1.68E-01	9.75E-02	9.84E-02	3.18E-02	1.96E-02	2.65E-02	7.75E-02	8.76E-02	1.91E-01	5.09E-01	7.51E-01	5.11E-01	2.60E+00
10	1.09E-01	1.08E-01	5.93E-02	1.33E-01	1.51E-01	1.61E-01	3.21E-01	7.06E-01	4.55E-01	3.72E-01	3.28E-01	3.46E-01	3.12E+00
14	6.42E-01	5.19E-01	5.19E-01	3.64E-01	4.65E-01	3.75E-01	2.60E+00	4.12E+00	2.20E+00	2.55E+00	2.49E+00	2.16E+00	1.92E+01
16	3.64E+00	3.31E+00	1.15E+00	8.83E-01	1.76E+00	1.48E+00	4.00E+01	4.31E+01	1.21E+01	1.27E+01	2.08E+01	2.67E+01	1.59E+02
20	3.63E+00	4.23E+00	4.32E+00	1.68E+00	4.17E+00	3.09E+00	9.58E+00	1.83E+01	1.23E+01	9.51E+00	6.48E+00	4.16E+00	8.27E+01
27	1.34E-01	7.01E-02	3.31E-02	8.63E-03	8.36E-03	1.18E-02	4.71E-01	3.25E-01	6.76E-01	1.42E+00	1.52E+00	1.87E+00	6.43E+00
80	2.67E+00	2.33E+00	1.61E+00	1.36E+00	2.38E+00	1.82E+00	1.56E+01	2.40E+01	9.21E+00	1.03E+01	1.04E+01	8.14E+00	8.93E+01
81	2.92E+02	2.51E+02	6.01E+00	5.82E+00	1.16E+01	1.30E+01	2.17E+02	1.31E+03	8.69E+02	8.63E+02	6.39E+02	4.45E+02	4.96E+03
82	6.88E+00	1.07E+01	8.72E+00	5.25E+00	6.15E+00	7.65E+00	7.53E+00	1.06E+01	2.01E+01	3.22E+01	2.80E+01	1.79E+01	1.62E+02
83	3.16E+00	5.39E+00	2.09E+00	3.13E+00	3.89E+00	4.51E+00	5.33E+00	7.45E+00	9.24E+00	1.28E+01	1.53E+01	1.29E+01	8.39E+01

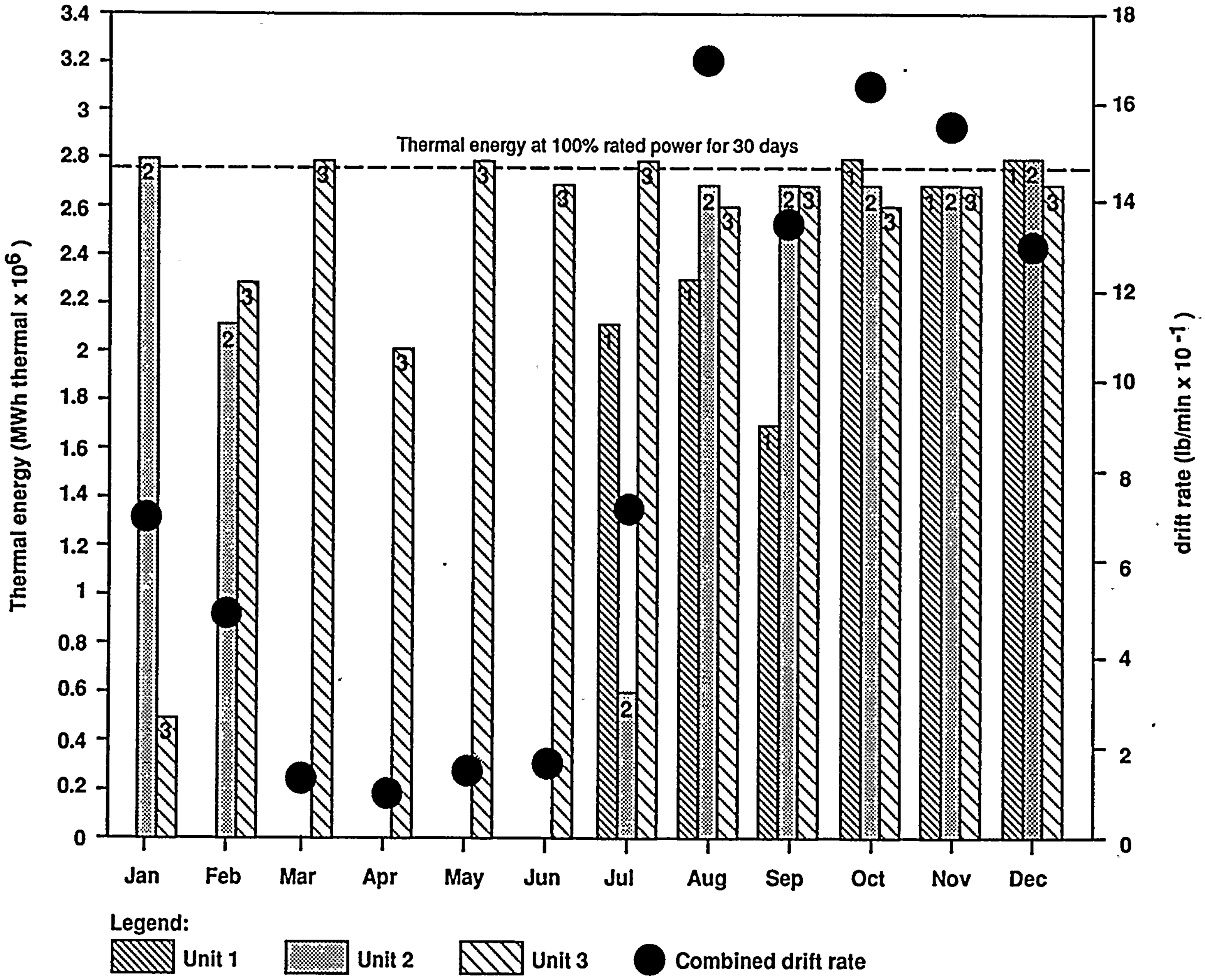


Figure 4-1. Thermal energy generation and drift rate for cooling towers at PVNGS, 1990

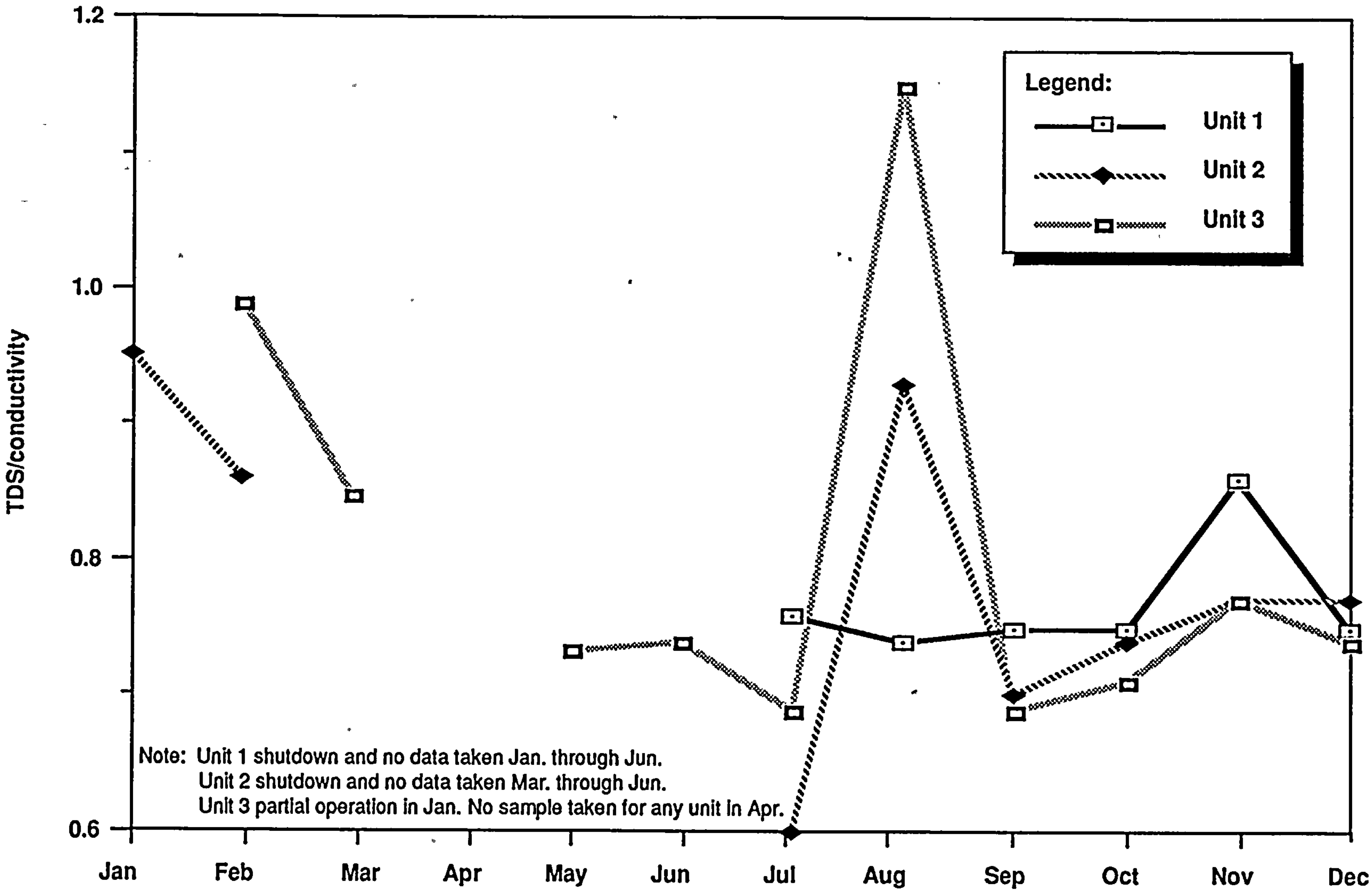


Figure 4-2. Ratio of total dissolved solids (TDS) to conductivity for cooling tower basin water at PVNGS, 1990

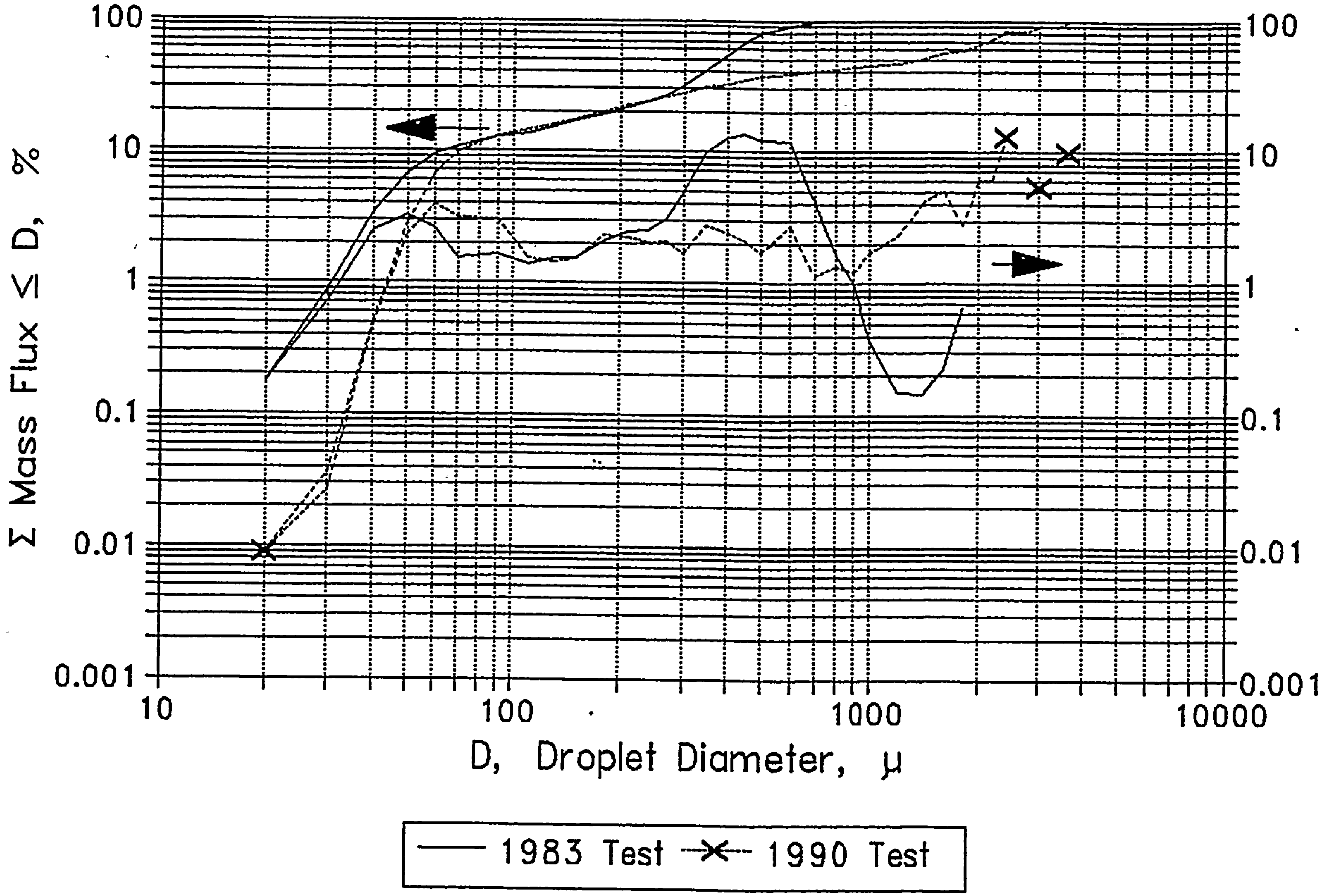
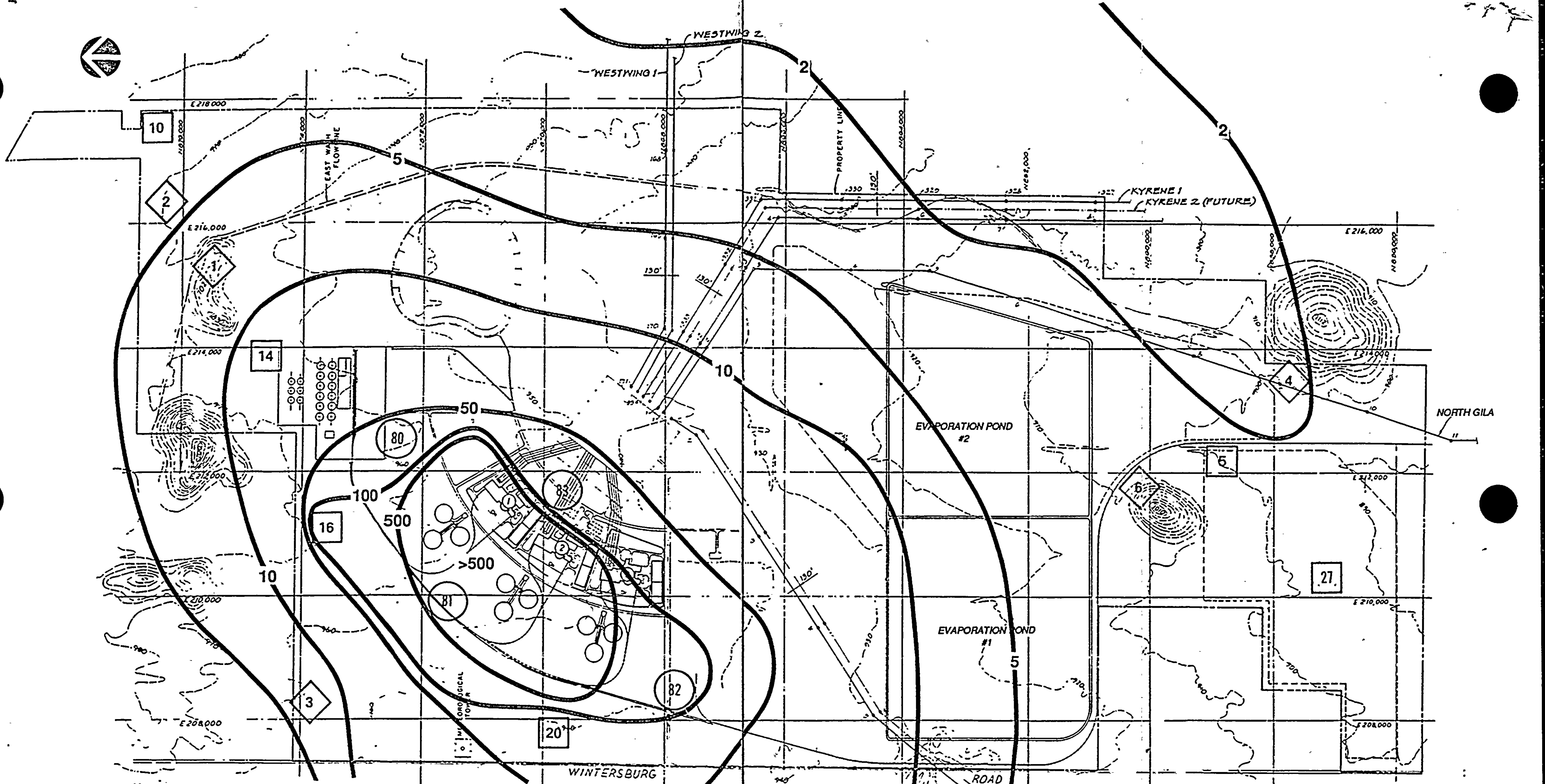


Figure 4-3. PVNGS cooling tower drift measurements percent mass flux vs. droplet diameter



Notes:
PVNGS 16-bin spectra (ESC, 1990) for Units 1 & 2
PVNGS 16-bin spectra (ESC, 1983) for Unit 3
01/01/90 – 12/31/90
0.00075% Drift rate for Units 1 & 2
0.0002% Drift rate for Unit 3
3 Units (9 towers)
Total drift deposition, lb/(acre) (yr)

Monitoring Sites
- ◇ Native vegetation, dustfall, soils
- □ Dustfall, soils
- ○ Dustfall

600 0 600 1200 Feet

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Figure 4-4

FOG code predictions of 1990 onsite drift deposition for PVNGS Units 1, 2, and 3

9105090327-03

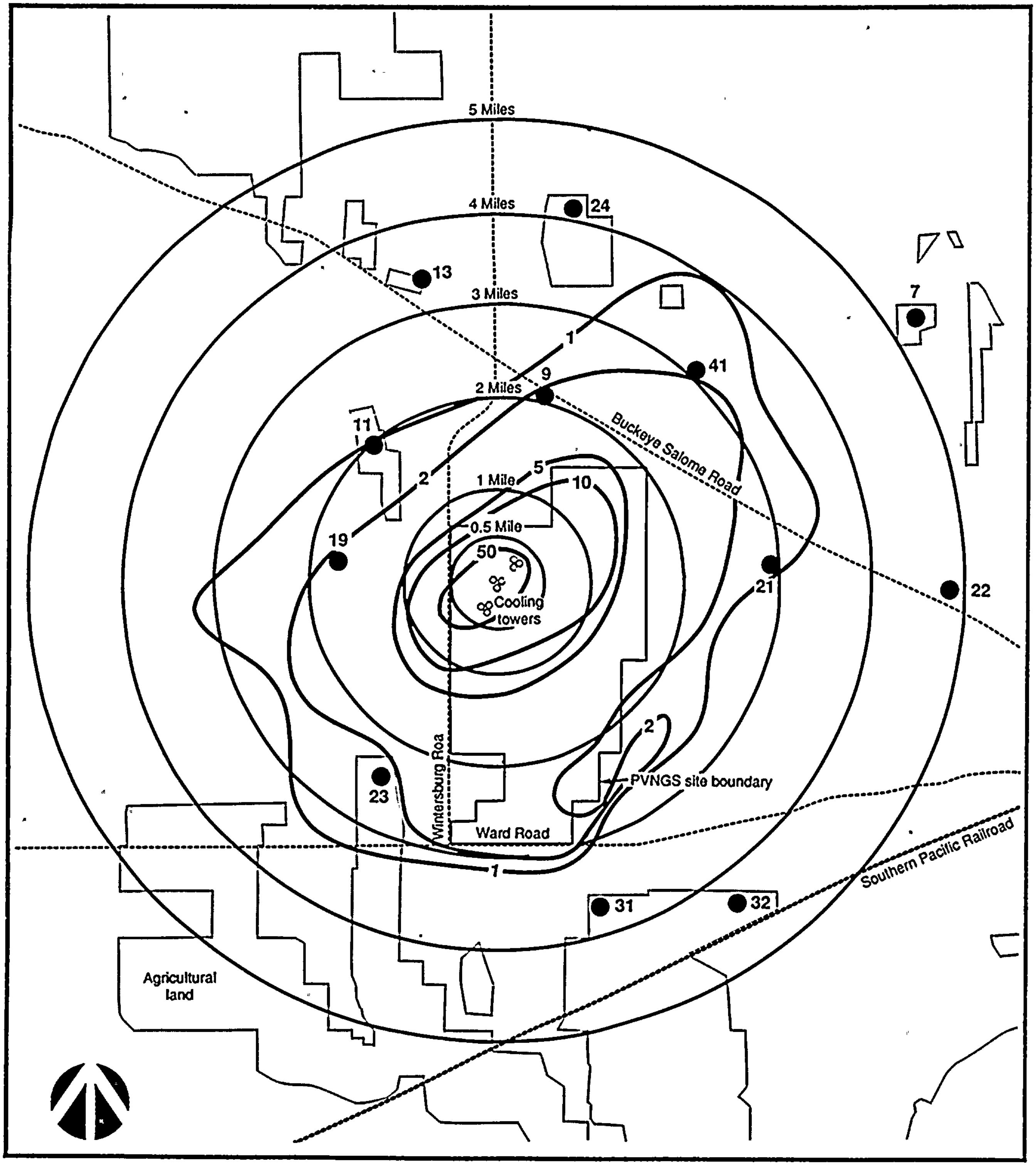
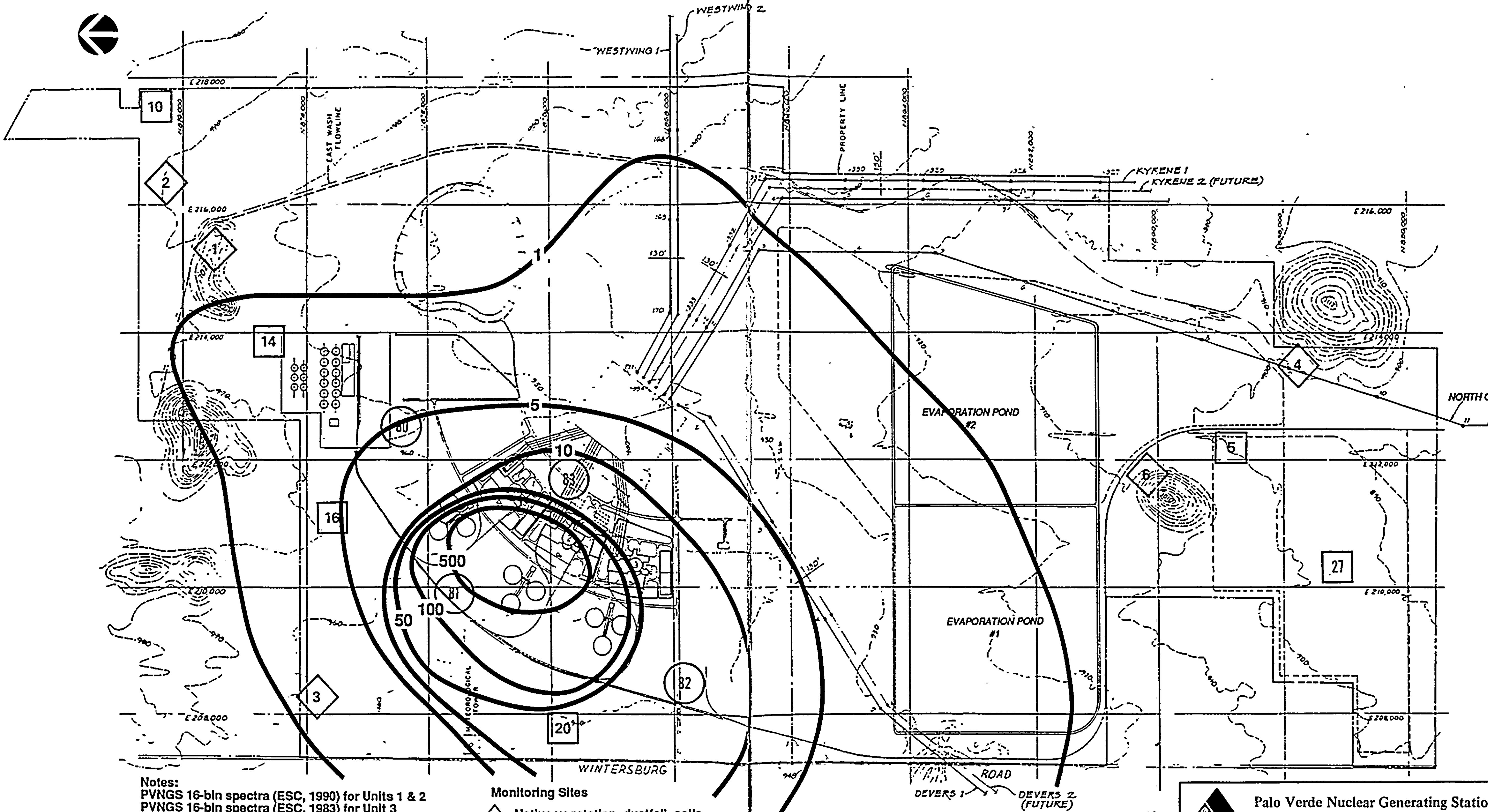


Figure 4-5. FOG code predictions of 1990 offsite drift deposition for PVNGS Units 1, 2, and 3



Notes:
PVNGS 16-bin spectra (ESC, 1990) for Units 1 & 2
PVNGS 16-bin spectra (ESC, 1983) for Unit 3
01/01/90 – 03/31/90
0.00075% Drift rate for Units 1 & 2
0.0002% Drift rate for Unit 3
3 Units (9 towers)
—— Total drift deposition, lb/(acre) (quarter)

Monitoring Sites
◇ Native vegetation, dustfall, soils
□ Dustfall, soils
○ Dustfall

600 0 600 1200 Feet

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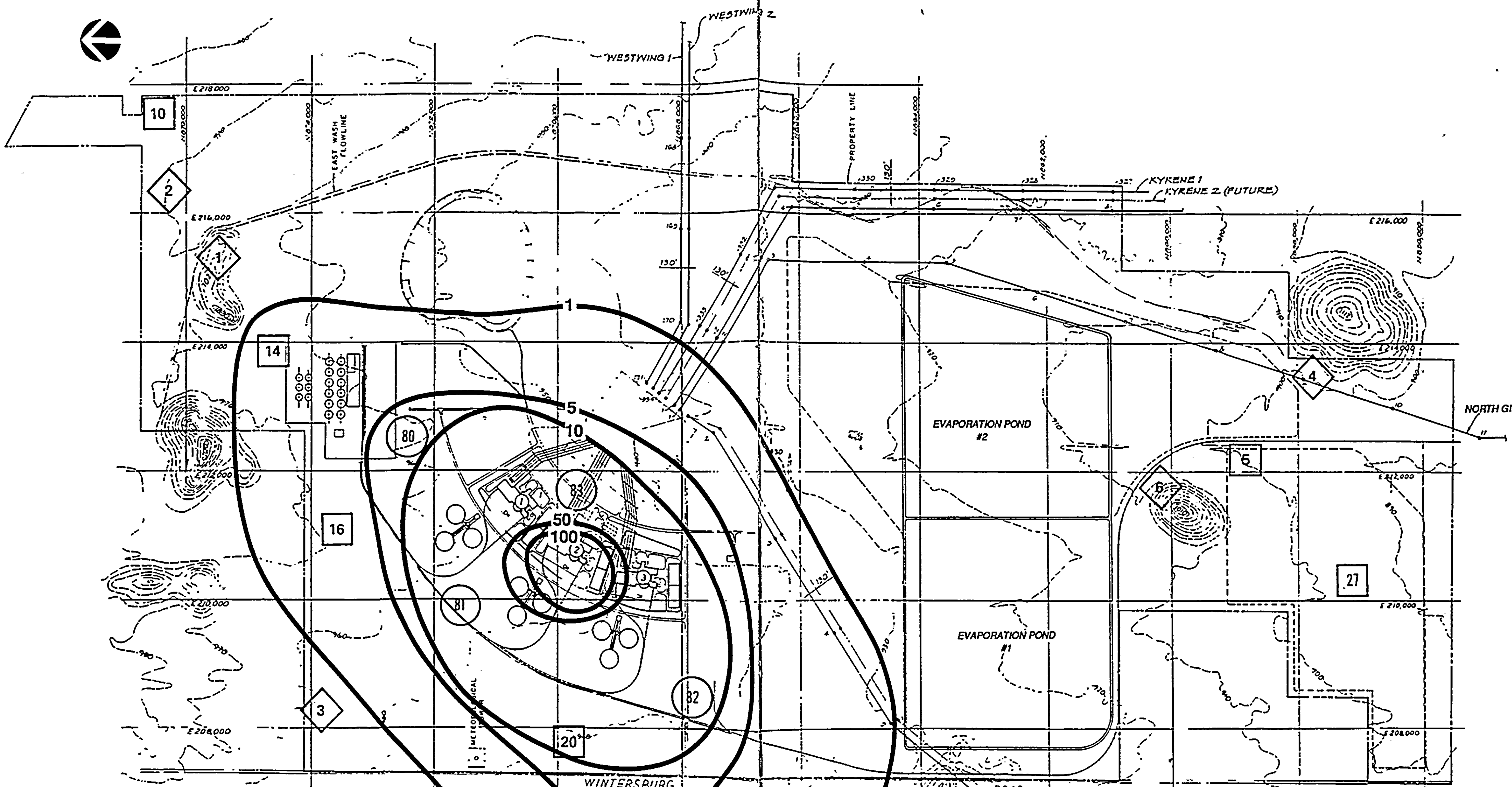
Figure 4-6

FOG code predictions of first quarter 1990 onsite drift deposition for PVNGS Units 1, 2, and 3

9105090327-04



Notes:
PVNGS 16-bin spectra (ESC, 1990) for Units 1 & 2
PVNGS 16-bin spectra (ESC, 1983) for Unit 3
04/01/90 – 06/30/90
0.00075% Drift rate for Units 1 & 2
0.0002% Drift rate for Unit 3
3 Units (9 towers)
Total drift deposition, lb/(acre) (quarter)

Monitoring Sites
◇ Native vegetation, dustfall, soils
□ Dustfall, soils
○ Dustfall

600 0 600 1200 Feet

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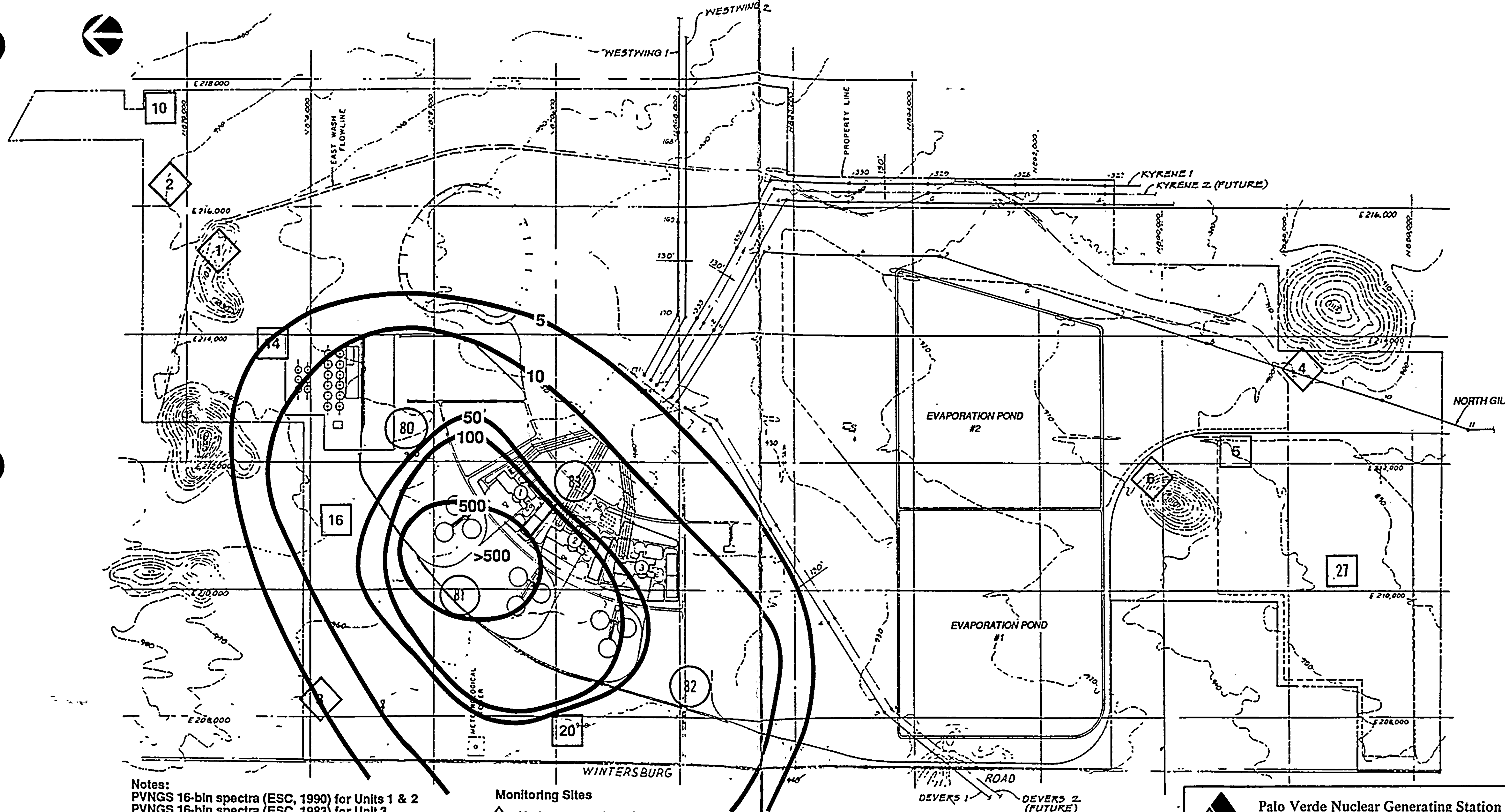
Figure 4-7

FOG code predictions of second quarter 1990 onsite drift deposition for PVNGS Units 1, 2, and 3

9105090327 - 05



Notes:
PVNGS 16-bin spectra (ESC, 1990) for Units 1 & 2
PVNGS 16-bin spectra (ESC, 1983) for Unit 3
07/01/90 – 09/30/90
0.00075% Drift rate for Units 1 & 2
0.0002% Drift rate for Unit 3
3 Units (9 towers)
—— Total drift deposition, lb/(acre) (quarter)

Monitoring Sites
◇ Native vegetation, dustfall, soils
□ Dustfall, soils
○ Dustfall

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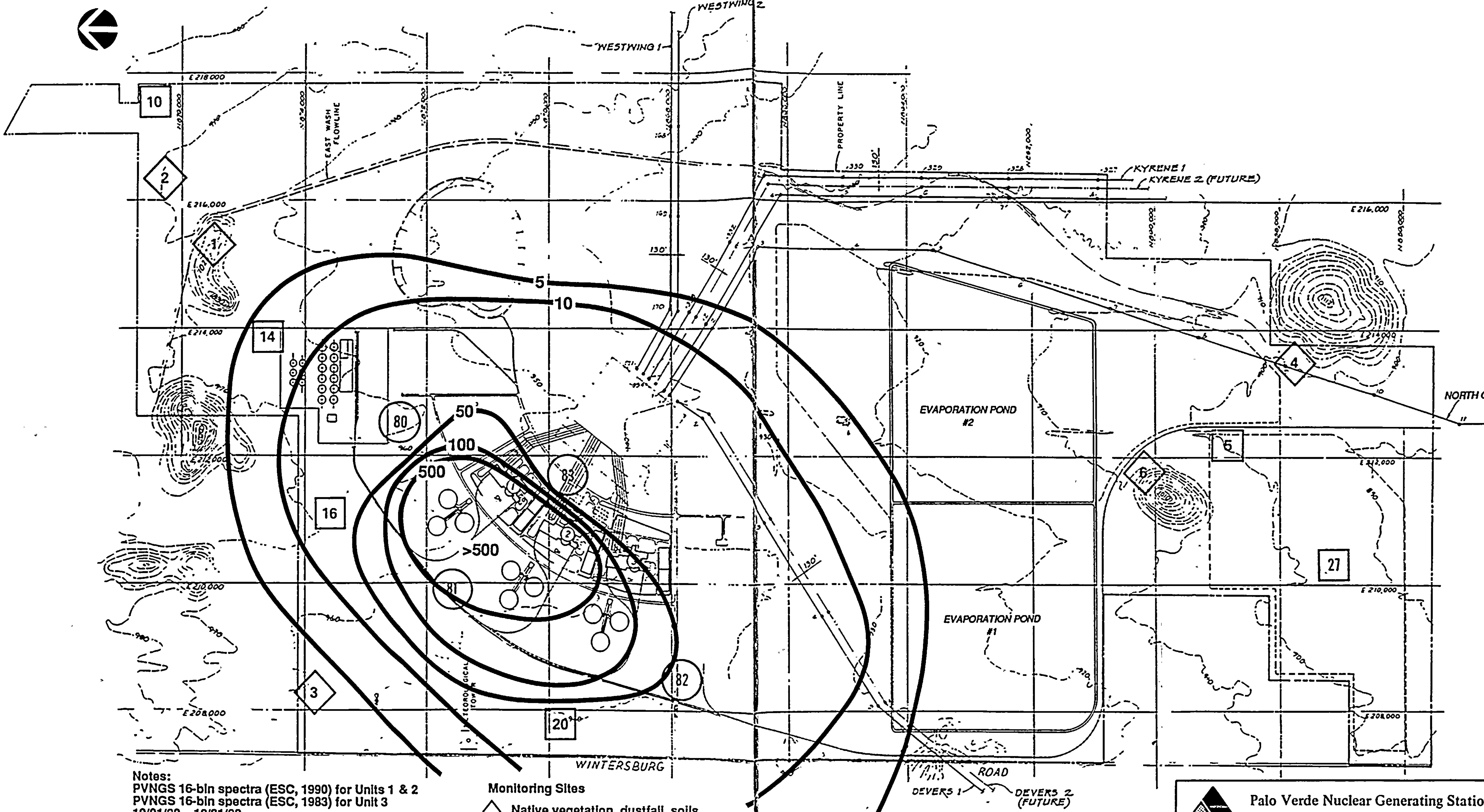
Figure 4-8

FOG code predictions of third quarter 1990 onsite drift deposition for PVNGS Units 1, 2, and 3

9105090327-06



Notes:
PVNGS 16-bin spectra (ESC, 1990) for Units 1 & 2
PVNGS 16-bin spectra (ESC, 1983) for Unit 3
10/01/90 – 12/31/90
0.00075% Drift rate for Units 1 & 2
0.0002% Drift rate for Unit 3
3 Units (9 towers)
Total drift deposition, lb/(acre) (quarter)

Monitoring Sites
◇ Native vegetation, dustfall, soils
□ Dustfall, soils
○ Dustfall

600 0 600 1200 Feet

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Figure 4-9

FOG code predictions of fourth quarter 1990 onsite drift deposition for PVNGS Units 1, 2, and 3

9105090327-07

5 Salt Deposition

5.1 INTRODUCTION

In order to monitor the amount of drift deposition in the area surrounding PVNGS, samples collected during 1990 from the dustfall jars at the 44 primary monitoring locations (Figure 2-1) and at the four supplemental onsite monitoring locations (see Section 2.3) were analyzed for drift constituents.

Drift deposition was also evaluated through analyses of suspended particulate matter obtained from onsite and near-site low-volume (lo-vol) air samplers. (See Chapter 2 of this report for a discussion on the drift deposition and air sampler monitoring programs.)

The drift deposition data were analyzed to provide temporal and areal distributions of the deposition of ions present in the cooling tower circulating water as well as the deposition of total suspended solids (TSS). In addition, statistical analyses were performed to determine the significance of differences in the deposition of these ions and to relate any observed changes to variations in cooling tower operations. The types of statistical analyses employed were based on the amounts and distributions of the deposition and lo-vol sample data available.

5.2 DEPOSITION DATA COLLECTION SUMMARY

The two drift deposition samples collected monthly at each of the 48 monitoring locations were analyzed for the concentration of those ions expected to constitute the majority of the salt drift from the cooling tower and for TSS. The concentrations for each analyte were converted to deposition rates in pounds per acre per month based on the collection jar surface area and each sample's collection period and water volume. This section addresses the results for the 12-month monitoring period of January 1 through December 31, 1990. Appendix C presents all results of monthly deposition analyses for the period by location.

Many of the monthly samples produced concentrations at or below the limit of detectability of the laboratory analytical procedures. Of the 14 parameters

measured in each sample, fluoride, sulfate, carbonate, ammonium, and copper were routinely below their analytical detection limits.

Detection limits for the analyzed parameters are presented in Table 5-1. Also provided in the table are minimum detectable deposition rates normalized to a 12-month period and the percentage of samples whose concentrations were below detection for each constituent. These minimum deposition rates are based on the detection limit of the analysis method, a nominal monthly sample water volume and period of collection, and the surface area of the collector opening. The sample water volume available for analysis consists of the water remaining in the collector at the end of the month and the rinse water. It varies with the season and the amount of rinse water necessary to clean the dust from the collector. Since the water volume is different for each location and sample, the actual minimum detectable deposition rate for an ion varies for each sample. In Appendix C, those deposition values that are below the analytical detection limit are reported at one-half the laboratory detection limit for that analyte.

5.2.1 Special Considerations in Data Evaluation

The data listed in Appendix C are collected and processed routinely; there is no field evaluation of changes at the monitoring locations or correction for significant concentrations of the measured ions in the field blanks of the sample collection water. Field evaluation of the samples is limited to accepting or voiding a sample because of possible contamination by birds, insects, or vandalism.

Of the 13 agricultural monitoring locations, eight (sites 7, 12, 24, 25, 28, 31, 32, and 45) were fallow during the 1990 growing season. The deposition measured at these eight locations was probably less than it would be during periods of cultivation.

5.2.2 Drift Deposition Results

The method for analyzing the 1990 deposition data featured the modifications adopted in 1987 to allow for better representation of the observed data. Prior to 1987, the mean deposition for a particular monitoring location was taken as the average of the two collocated samples. Values below the

detection limit were considered missing. However, beginning in 1987, each collocated sample was included as a discrete datum. Data below the detection limit were assigned a value of one-half the detection limit. This method is suggested by Nehls and Akland (1973) for data sets containing values below the laboratory detection limit. A constraint of this method is that no more than 25 percent of the data may be below the detection limit without possibly introducing a bias in the computed statistics. Gilbert (1987) determined this method to be unbiased for the mean but not for the variance if all measurements between zero and the detection limit are uniformly distributed. A more detailed description of this method, as well as a comparison of it with previous methods, is included in NUS-5073 (NUS, 1988b).

Monthly deposition values were analyzed individually by monitoring location and month. Concentrations below the detection limit were assumed to be uniformly distributed. Sodium, potassium, calcium, magnesium, and TSS were analyzed statistically to determine the spatial and temporal variations of the data.

Monthly means of deposition for each site were analyzed with least-significant-difference and F-Test statistics to determine the variability of the data throughout the study region and year. Unless stated otherwise, differences are reported as significant at the 95-percent confidence level. Although means were generated for nitrate, phosphate, ammonium, and chloride for comparison, no further statistical analysis was performed because of the high percentage of data below the detection limit.

The sites were divided into agricultural and native (i.e., nonagricultural) sites and the deposition totals of the analyzed ions examined statistically. The significance of this division can be seen in Table 5-2. The mean deposition values for potassium, calcium, magnesium, and total suspended solids were significantly higher for the agricultural sites than for the native sites. The standard errors, which are a measure of data variability, were also larger for the agricultural sites. Further discussion of these variations is provided in Chapter 9.

5.2.2.1 Drift Deposition at Agricultural Sites

Figures 5-1 and 5-2 present the mean monthly deposition of the eight measurable ions and TSS at the 13 agricultural sites (sites 7, 11-13, 23-25, 28, 30-32, 43, and 45). Generally, the variation in deposition for sodium, chloride, calcium, and TSS was large both within a month and from month-to-month. This can be attributed primarily to wet and dry season fugitive dust trends and to seasonal agricultural practices that release varying amounts of these ions and settleable dust into the atmosphere. Because of this variability, the apparent peaks (except for sodium and chloride in September) are not statistically significant. Most ions had higher deposition in April, July, and August or September. This can be attributed to cultivation and planting in April and the dryness in July and August.

Table 5-3 presents an analysis of the deposition of three of the primary cations (sodium, potassium, and calcium) in the cooling tower basin water for each agricultural site. Sodium at sites 23 and 43 was significantly higher than at eight other agricultural sites, of which six (sites 7, 12, 24, 25, 28, and 45) were fallow during 1990. Potassium and calcium at site 23 were also significantly higher for the year than at the other 12 agricultural sites. This may be attributable to agricultural activity.

Examination of the data in Appendix C indicates that, among the agricultural sites, sites 23 and 30 had the maximum deposition rates of most ions, while sites 24, 25, and 28 (all fallow) had the minimum deposition rates of most ions.

5.2.2.2 Drift Deposition at Native (Nonagricultural) Sites

Figures 5-3 and 5-4 present the mean monthly deposition of eight measurable ions and total suspended solids at all the native sites (1-6, 8-10, 14-22, 26, 27, 33-42, 44, and 80-83). As with the agricultural sites, the variability of the deposition rates of sodium, chloride, calcium, and TSS was large. Sodium and chloride were essentially constant through June and then increased to a peak in September and a secondary peak in December. Calcium increased to a peak in July and showed a general decline through the year-end. Behavior similar to that of calcium was exhibited by TSS, potassium,

and magnesium. A January maximum, a trend seen in previous years, was not evident. Measurements made at the supplemental sites, which are the most indicative of plant-origin effects, are discussed separately in this section.

Analysis of the distribution of the monthly means of deposition for the native sites of three of the predominant cations (sodium, potassium, and calcium) in the drift indicates that statistically different groups can be identified. Table 5-4 presents an analysis of the annual deposition (means ± standard errors) of these cations for each native site. For sodium, the deposition at sites 20 and 81 was significantly greater (approximately 22 pounds per acre per year) than at all other native sites except site 80. The analyses for calcium indicate that the annual deposition at site 80 was significantly greater than that of any of the other sites. Site 80 is about 1500 feet southwest of the Water Reclamation Facility and west-southwest of the sludge landfill, and it is probably affected by the lime-drying and handling activities and the associated vehicular traffic at those locations. Similarly, sites 3, 9, 14, 19, and 83, which had significantly higher calcium deposition than most other sites, are also in the vicinity of the sludge landfill, except for site 19, which is west of the site. The annual deposition of potassium was significantly greater at site 19 than at any other site.

Figures 5-5 and 5-6 provide the mean monthly deposition for the four supplemental sites. Both sodium and chloride had maximum deposition rates in December. Both showed an overall increase through the year. Potassium, calcium, and phosphate displayed similar increases through the year but had peaks in July. No abnormal meteorological trends were evident in December that would account for this behavior. As shown in Figure 4-1, the combined nominal drift was at a maximum in August, and the power level was at the maximum for the year in December. The drift rate and power level were slightly lower than these maxima in October and November.

Table 5-5 presents the annual deposition (means ± standard errors) for all ions and for TSS for all native sites except the four supplemental sites, for all onsite monitoring locations except the supplemental sites, and for the four supplemental sites alone. Drift from the cooling towers should be most evident at the supplemental sites, which are close to the cooling towers (see

Section 2.3). The annual mean deposition of sodium, calcium, and magnesium at the supplemental sites was significantly higher than at all other native sites and onsite locations. Chloride deposition was also much higher at the supplemental sites than at the other native sites and onsite locations. However, statistics for significant difference were not generated for chloride because more than 25 percent of the data for all the other native sites were below detection. Table 5-5 shows rather large differences for sodium, chloride, calcium, and TSS between the values for sites 80-83 and those at other onsite locations.

5.2.2.3 Agricultural Versus Native Paired Control Sites

The salt deposition monitoring network includes two sets of neighboring agricultural and native control sites. The purpose of the control sites is to measure natural background levels and distributions of ionic deposition at distances unlikely to be affected by PVNGS cooling tower emissions. These paired sites are sites 25 and 40, approximately 20 miles northwest of PVNGS, and sites 42 and 43, approximately 15 miles southeast; sites 25 and 43 are the agricultural sites.

Table 5-6 presents the annual deposition of measured ions and TSS for each control site. Statistics showing significant differences for nitrate, phosphate, ammonium, and chloride were not computed for this table because more than 25 percent of the data for each analyte were below the detection limit. A comparison of these sites shows that potassium and calcium deposition at sites 25 and 43 (the agricultural sites) and site 40 (native) was significantly higher than that at site 42 (native), and that magnesium deposition at sites 25 and 40 also significantly exceeded that at site 42.

Sodium deposition at site 43 was significantly higher than that at the other three control sites. Site 40 (native) showed significantly higher deposition of TSS than sites 42 and 43.

5.2.2.4 Ion Ratios

The analyses of cooling tower basin water provide concentrations of ions present in the drift emitted from the towers. The drift should preserve the proportions of most of these constituents. A comparison of ratios of these

constituents in the deposition samples with those in the drift should provide an indication of the contribution of the drift to the measured deposition rates at any location.

Table 5-7 presents the ratios of the average values for agricultural and native locations for sodium to potassium, sodium to calcium, sodium to magnesium, and sodium to nitrate. The native sites are broken down into three groups: all-native, onsite (less supplemental), and supplemental. Onsite locations in the comparison include sites 1-6, 10, 14, 16, 20, and 27. The corresponding average ratios for cooling tower water composition for 1990 are also included in Table 5-7 for comparison. The ratios for the monitoring site measurements were fairly consistent between the all-native and onsite groups. The supplemental sites had larger ratios than all other site groups, except for the sodium/calcium ratio. However, the ratios for all sites were much lower than those observed in the cooling tower circulating water.

5.2.3 Conclusions

From analyses of the salt deposition data for the report period, the following primary conclusions can be drawn (refer to Section 9.2 for the relationship of these conclusions to cooling tower operation):

1. In 1990, increased deposition of drift constituents was clearly detectable both onsite and at offsite native (site 19) and agricultural (site 23) locations.

2. Agricultural sites showed significantly higher average salt deposition than native sites (Table 5-2), even when the supplemental onsite locations near the cooling towers were included in the latter set. This was evident for the mean of all sites, including the paired control sites (Table 5-6). The sum of mean measured ion deposition rates totaled approximately 69 and 43 pounds per acre per year for the agricultural and native sites, respectively.

   The deposition rate for sodium for the native sites was significantly lower than for the agricultural sites when the supplemental sites were not included in the calculation.

3. Characteristic of all sites was a great variability in monthly measurements of most ions and TSS. The exact pattern varied with the ion.

4. The deposition rates of two of the three predominant cations (calcium and potassium) were significantly higher at site 23 than those at all other agricultural sites (Table 5-3). The highest mean annual sodium deposition rate measured at any agricultural site was approximately 13 pounds per acre per year at site 23, about 2 miles southwest of the Unit 2 cooling towers. No other geographic trends were evident for agricultural sites.

5. The supplemental sites nearest the cooling towers had considerably higher mean salt deposition rates for sodium, calcium, chloride, and TSS than all other native sites (Table 5-5). However, sites 20 and 81 showed significantly higher deposition rates of sodium (22 pounds per acre) than all the other native sites except site 80 (Table 5-4). Site 80 (onsite) showed a significantly higher deposition rate of calcium (97 pounds per acre per year) than all other native sites. This was probably due to the sludge and bulk lime handling and calcining activities at the Water Reclamation Facility northeast of site 80.

6. Increased average salt deposition rates and higher ion ratios (Table 5-7) were generally observed at the onsite and supplemental sites. A comparison of these parameters with ratios for all native and agricultural sites clearly evidenced the presence of drift from the PVNGS cooling tower operation, particularly at the supplemental sites. Section 9 presents a more detailed assessment of these data in comparison with predictions and with those parameters measured during the preoperational period.

5.3 SUSPENDED PARTICULATE MATTER

5.3.1 Sample Collection

Airborne particulate matter has been collected at six locations around the PVNGS site and in nearby residential areas as part of the station radiological monitoring program. Air particulate samples are collected

weekly at sites 8, 9, 10, 20, 21, and 27 with low-volume air samplers (lo-vols) that draw air through a 2-inch-diameter filter. The filters are analyzed weekly for radioactivity and, since the initiation of the salt drift monitoring program, composited monthly for analyses of calcium, chloride, iron, fluoride, potassium, magnesium, sodium, nitrate (as N), sulfate, and total phosphate (as P). As indicated in the Salt Deposition and Impact Monitoring Plan, Revision 5, (NUS, 1987c), "the primary purpose of analyzing the filters for salt concentration is to determine if there is a correlation between salt deposition (determined from the drift deposition analysis) and the airborne concentration at a location." Average concentrations for each of the 10 ions at individual locations by month for 1990 are presented in Appendix D.

5.3.2 Data Analysis

Table 5-8 presents monthly concentrations (means and standard errors) of sodium, calcium, magnesium, nitrate, sulfate, fluoride, and chloride. As with the drift deposition data, lo-vol data below the laboratory detection limit were included, assuming their value to be one-half that limit. Nearly all analyses for iron, potassium, and phosphate were below detection limits, and these ions were not included in any comparative evaluations. Mean concentrations of magnesium, nitrate, and fluoride varied little between sites; sodium, calcium, sulfate, and chloride showed more variability. Sodium and chloride, primary ions in the PVNGS cooling tower drift, showed a small but statistically significant peak in mean concentrations at site 20. Site 20 is the lo-vol site closest to the cooling towers.

Figures 5-7 and 5-8 indicate the variation in the mean monthly concentrations of the measured ions for the report period. There were no trends similar to those reflected in the deposition measurements.

5.3.3 Comparison of Airborne Concentrations and Drift Deposition Data

Of the 10 ions for which analyses were performed on the lo-vol filters, iron is the only element that was not measured in the drift deposition. However, only five ions (sodium, calcium, chloride, nitrate, and magnesium) were present in both deposition and airborne samples at concentrations greater

than their respective detection limits. Three of the five predominant ions were compared for possible associations between airborne concentrations and deposition using correlation coefficients; chloride and nitrate were not analyzed because of the large percentage of deposition and lo-vol data below detection limits. Table 5-9 presents the correlation coefficients between deposition and airborne concentrations for the three ions at the six locations. There was no significant correlation between average airborne concentrations and total deposition for any of the ions. Since both sampling methods involve collecting particulate matter samples from the same medium (air), a greater association between concentration and deposition might be expected. However, the lo-vol filters collect only the smaller particles suspended in air; larger particles, represented by those collected in the dustfall jars, are less likely to be drawn onto the lo-vol filter.

Table 5-1. Detectability of drift constituents at PVNGS, 1990

Constituent	Laboratory detection limit (mg/L)	Minimum detectable deposition rate (lb/(acre)(yr))*	Percentage of analyses below detection limit
Sodium, total	0.1	1.8	1.8
Potassium, total	0.1	1.8	10.0
Calcium, total	0.1	1.8	0.0
Magnesium, total	0.05	0.9	5.0
Chloride	0.3	5.4	50.3
Fluoride	0.5	9.0	99.3
Sulfate	1.0	18.0	90.8
Nitrate (as N)	0.05	0.9	67.1
Phosphate (as P)	0.02	0.36	68.5
Carbonate	5.0	†	100.0
Bicarbonate	5.0	90.0	62.4
Ammonium (as N)	0.2	3.6	81.8
TSS (at 105°C)	5.0	90.0	15.8
Copper, total	0.1	‡	95.5

Key: TSS, total suspended solids.

*Determined for standard sample volume of 3000 milliliters for rinse water and remaining collector water each month, normalized to 1 year.

†Based on pH.

‡Total mass determined only.

Table 5-2. Deposition (lb/(acre)(yr)) of drift constituents at all PVNGS agricultural and native monitoring sites, January 1-December 31, 1990 (means ± standard errors)

Constituent	Agricultural sites	Native sites	Ratio, agricultural to native sites
Sodium	7.0 ± 0.5	7.0 ± 0.3	1.0 ± 0.08
Potassium	7.1 ± 0.6	3.3 ± 0.1	2.2 ± 0.20
Calcium	34.1 ± 2.6	17.7 ± 1.0	1.9 ± 0.18
Magnesium	10.5 ± 1.1	4.9 ± 0.2	2.1 ± 0.24
Nitrate (as N)	1.0 ± 0.1	1.0 ± 0.04	1.0 ± 0.11
Phosphate (as P)	0.7 ± 0.1	0.3 ± 0.01	2.3 ± 0.34
Ammonium (as N)	2.9 ± 0.2	2.2 ± 0.06	1.3 ± 0.10
Chloride	5.8 ± 0.4	6.4 ± 0.3	0.9 ± 0.08
TSS	864.7 ± 92.5	423.4 ± 19.2	2.0 ± 0.23

Key: TSS, total suspended solids.

Table 5-3. Deposition (lb/(acre)(yr)) of sodium, potassium, and calcium at PVNGS agricultural sites, 1990 (means ± standard errors)

Site	Sodium	Potassium	Calcium
7	3.9 ± 0.4^{a}	3.1 ± 0.4^{a}	22.9 ± 6.4^{abc}
11	5.0 ± 0.6^{ab}	4.8 ± 0.8^{abc}	25.7 ± 3.5^{abc}
12	4.9 ± 0.9^{ab}	6.5 ± 1.5^{abcd}	19.6 ± 2.8^{abc}
13	6.9 ± 1.0^{abcd}	7.3 ± 1.1^{cd}	32.3 ± 5.2^{bcd}
23	12.71 ± 1.7^{e}	33.1 ± 4.3^{e}	145.5 ± 16.8^{e}
24	4.8 ± 1.2^{ab}	3.4 ± 0.5^{abc}	16.5 ± 1.6^{ab}
25	3.6 ± 0.3^{a}	5.1 ± 0.9^{abc}	14.2 ± 1.7^{a}
28	5.2 ± 1.1^{abc}	2.7 ± 0.4^{a}	33.9 ± 7.1^{bcd}
30	8.4 ± 0.7^{abcde}	9.4 ± 1.2^{d}	47.2 ± 5.4^{d}
31	10.3 ± 4.3^{cde}	3.0 ± 0.6^{a}	18.0 ± 2.7^{abc}
32	9.1 ± 2.0^{bcde}	7.1 ± 1.2^{bcd}	34.2 ± 5.9^{cd}
43	11.0 ± 3.6^{de}	4.9 ± 0.7^{abc}	14.7 ± 1.2^{a}
45	4.9 ± 0.4^{ab}	3.3 ± 0.4^{ab}	23.9 ± 5.8^{abc}

Key: For each ion, values with same superscript letter are not significantly different at 95-percent confidence level.

Table 5-4. Deposition (lb/(acre)(yr)) of sodium, potassium, and calcium at PVNGS native monitoring sites, 1990 (means ± standard errors)

Site	Sodium	Potassium	Calcium
1*	5.1 ± 0.5abcd	2.7 ± 0.4abc	14.0 ± 1.7abcd
2*	5.4 ± 0.6abcd	2.9 ± 0.4abcd	13.3 ± 2.2abcd
3*	11.2 ± 0.4efg	4.4 ± 0.6def	22.4 ± 2.4cdef
4*	5.7 ± 1.1abcd	3.4 ± 0.4abcde	17.5 ± 2.0abcde
5*	5.6 ± 0.7abcd	2.8 ± 0.3abcd	19.0 ± 3.1abcde
6*	8.9 ± 3.2def	3.0 ± 0.5abcd	16.6 ± 2.4abcde
8	4.9 ± 0.5abcd	2.6 ± 0.2ab	13.2 ± 1.9abcd
9	6.1 ± 0.8abcd	3.6 ± 0.5bcde	22.2 ± 3.2bcdef
10*	5.6 ± 0.7abcd	3.1 ± 0.5abcde	15.6 ± 2.0abcd
14*	8.0 ± 1.1bcde	3.0 ± 0.5abcd	30.2 ± 7.9ef
15	3.7 ± 0.4abc	2.9 ± 0.4abcd	15.4 ± 2.1abcd
16*	8.4 ± 1.2cdef	3.2 ± 0.4abcde	17.4 ± 3.1abcde
17	4.0 ± 0.4abc	3.0 ± 0.7abcd	9.4 ± 1.0abcd
18	5.6 ± 0.8abcd	2.6 ± 0.3ab	11.6 ± 1.7abcd
19	7.0 ± 1.0abcde	9.7 ± 1.9g	34.8 ± 5.7f
20*	21.5 ± 4.9i	4.3 ± 0.5cde	14.6 ± 2.0abcd
21	3.8 ± 0.3abc	2.4 ± 0.3ab	11.1 ± 0.9abcd
22	3.0 ± 0.3a	2.4 ± 0.3ab	11.6 ± 1.4abcd
26	4.9 ± 0.8abcd	2.7 ± 0.4abc	11.9 ± 1.1abcd
27*	5.1 ± 0.6abcd	3.1 ± 0.5abcde	12.5 ± 1.8abcd
33	8.4 ± 3.3cdef	3.0 ± 0.5abcd	14.9 ± 2.0abcd
34	3.1 ± 0.3a	1.9 ± 0.2a	9.4 ± 0.9abcd
35	3.1 ± 0.3ab	3.2 ± 0.4abcde	14.3 ± 2.1abcd
36	3.0 ± 0.3a	2.3 ± 0.3ab	8.8 ± 1.0ab
37	7.0 ± 2.2abcde	2.8 ± 0.6abc	8.9 ± 0.7ab
38	2.9 ± 0.3a	1.9 ± 0.2a	9.6 ± 1.3abcd
39	3.0 ± 0.2a	2.3 ± 0.3ab	7.5 ± 0.7a
40	3.5 ± 0.4ab	4.7 ± 0.7ef	15.7 ± 2.0abcd
41	4.0 ± 0.3abc	2.5 ± 0.3ab	15.6 ± 2.7abcd
42	3.4 ± 0.2ab	2.4 ± 0.2ab	9.1 ± 1.0abc
44	3.9 ± 0.4abc	3.6 ± 0.5bcde	13.4 ± 1.5abcd
80*	17.8 ± 3.2hi	6.1 ± 1.5f	97.2 ± 26.5g
81*	21.8 ± 3.5i	3.8 ± 0.5bcde	21.0 ± 2.9abcde
82*	13.2 ± 2.4fgh	3.2 ± 0.5abcde	21.2 ± 3.2bcde
83*	13.8 ± 2.3gh	3.1 ± 0.3abcd	22.9 ± 2.4def

Key: For each ion, values with same superscript letter are not significantly different at 95-percent confidence level.

*Onsite location.

Table 5-5. Deposition (lb/(acre)(yr)) of drift constituents at PVNGS native sites, 1990 (means ± standard errors)

Constituent	All native sites (except 80-83)	All onsite sites* (except 80-83)	Sites 80-83
Sodium	5.8 ± 0.3	8.3 ± 0.7	16.7 ± 1.5
Potassium	3.2 ± 0.1[a]	3.3 ± 0.1[a]	4.0 ± 0.4[a]
Calcium	14.9 ± 0.5	17.6 ± 1.0	39.7 ± 7.2
Magnesium	4.4 ± 0.2[a]	4.9 ± 0.3[a]	9.0 ± 1.4
Nitrate (as N)†	0.9 ± 0.04	1.0 ± 0.1	1.2 ± 0.2
Phosphate (as P)†	0.3 ± 0.01	0.3 ± 0.03	0.4 ± 0.1
Ammonium (as N)†	2.2 ± 0.1	2.4 ± 0.2	2.1 ± 0.2
Chloride†	5.2 ± 0.2	7.3 ± 0.6	15.5 ± 1.3
TSS	396.2 ± 18.0[a]	415.1 ± 27.5[a]	638.5 ± 92.3

Key:
1. For each ion, means with same superscript letter are not significantly different at 95-percent confidence level.
2. TSS, total suspended solids.

*Sites 1-6, 10, 14, 16, 20, and 27.

†Difference statistics were not generated because of the high percentage of data below the detection limit.

Table 5-6. Deposition (lb/(acre)(yr)) of drift constituents at PVNGS agricultural and native control sites, 1990 (means ± standard errors)

Constituent	Agricultural sites 25	Agricultural sites 43	Native sites 40	Native sites 42
Sodium	3.6 ± 0.3[a]	11.0 ± 3.6[b]	3.5 ± 0.4[a]	3.4 ± 0.2[a]
Potassium	5.1 ± 0.9[b]	4.9 ± 0.7[b]	4.7 ± 0.7[b]	2.4 ± 0.2[a]
Calcium	14.2 ± 1.7[b]	14.7 ± 1.2[b]	15.7 ± 2.0[b]	9.1 ± 1.0[a]
Magnesium	5.8 ± 0.8[b]	4.1 ± 0.5[ab]	5.9 ± 1.1[b]	3.1 ± 0.5[a]
Nitrate (as N)†	0.6 ± 0.1	1.2 ± 0.2	0.6 ± 0.1	1.0 ± 0.2
Phosphate (as P)†	0.4 ± 0.1	0.8 ± 0.2	0.4 ± 0.1	0.3 ± 0.1
Ammonium (as N)†	2.4 ± 0.2	6.4 ± 1.5	2.3 ± 0.3	1.8 ± 0.2
Chloride†	4.0 ± 0.8	9.6 ± 2.0	3.3 ± 0.4	3.5 ± 0.3
TSS	510.9 ± 107.9[bc]	327.8 ± 49.6[ab]	546.5 ± 91.2[c]	275.4 ± 46.8[a]

Key: 1. For each ion, means with same superscript letter are not significantly different at 95-percent confidence level.
2. TSS, total suspended solids.

†Difference statistics were not generated because of the high percentage of data below the detection limit.

Table 5-7. Ratios of ionic constituents of drift deposition at PVNGS monitoring sites and in cooling tower basin water, 1990

Ratio	Drift deposition: All agricultural sites	Drift deposition: All native sites*	Drift deposition: Onsite sites†	Drift deposition: Supplemental sites	Cooling tower basin water‡
Sodium/potassium	1.0	2.1	2.5	4.2	22.3
Sodium/calcium	0.2	0.4	0.5	0.4	13.4
Sodium/magnesium	0.7	1.4	1.7	1.9	224.8
Sodium/nitrate	7.0	7.0	8.3	13.5	22.1

*Includes onsite and supplemental sites.

†Sites 1-6, 10, 14, 16, 20, and 27.

‡Weighted average based on number of months of operations for Units 1-3.

Table 5-8. Mean monthly concentrations of suspended particulates (μg/m^3) collected by low-volume air samplers at PVNGS monitoring sites, 1990 (means ± standard errors)

Ion	Site 8	Site 9	Site 10	Site 20	Site 21	Site 27
Sodium	0.63 ± 0.05	0.62 ± 0.04	0.64 ± 0.04	0.83 ± 0.08	0.60 ± 0.03	0.60 ± 0.04
Calcium	1.35 ± 0.09	2.02 ± 0.11	1.63 ± 0.10	1.52 ± 0.09	1.48 ± 0.12	1.33 ± 0.10
Magnesium	0.08 ± 0.01	0.11 ± 0.01	0.10 ± 0.01	0.09 ± 0.01	0.08 ± 0.01	0.08 ± 0.01
Nitrate (as N)	0.19 ± 0.01	0.23 ± 0.01	0.23 ± 0.01	0.22 ± 0.01	0.20 ± 0.01	0.21 ± 0.01
Sulfate	1.61 ± 0.27	1.53 ± 0.22	1.46 ± 0.26	1.86 ± 0.22	1.56 ± 0.25	1.52 ± 0.22
Fluoride	0.03 ± 0.00	0.04 ± 0.00	0.04 ± 0.00	0.04 ± 0.00	0.04 ± 0.00	0.03 ± 0.00
Chloride	0.26 ± 0.04	0.26 ± 0.04	0.26 ± 0.04	0.45 ± 0.07	0.25 ± 0.03	0.25 ± 0.03

Table 5-9. Correlation, R, between deposition and airborne concentration of predominant ions at PVNGS low-volume air sampler monitoring sites, 1990

Site	Ion		
	Calcium	Magnesium	Sodium
8	0.49	0.07	0.16
9	0.26	0.73	0.28
10	0.17	0.42	0.35
20	0.07	0.71	0.52
21	0.33	0.31	0.28
27	0.36	0.34	0.10

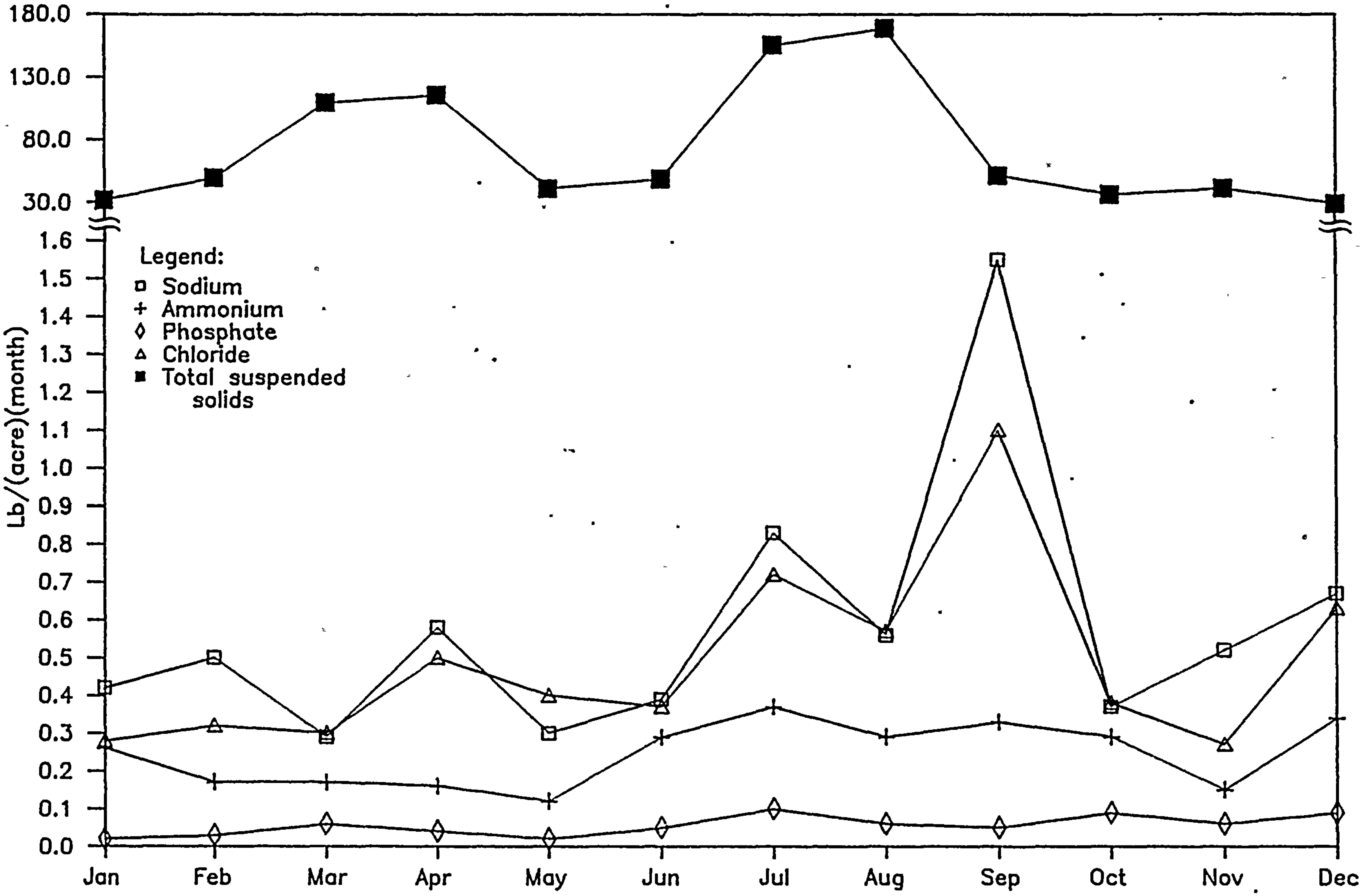

Figure 5–1. Mean monthly deposition of total suspended solids, sodium, ammonium, phosphate, and chloride at PVNGS agricultural monitoring sites, 1990

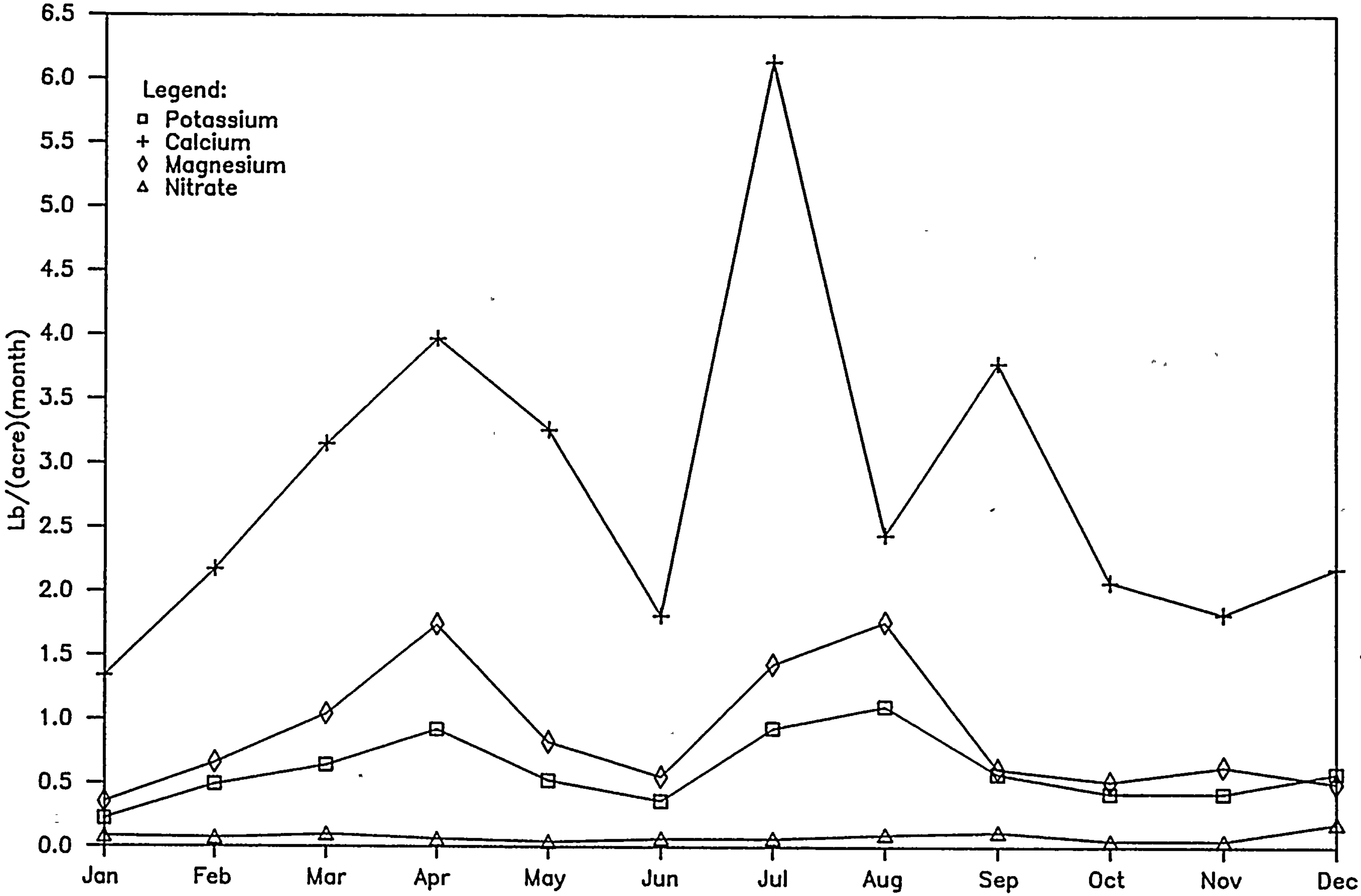

Figure 5–2. Mean monthly deposition of potassium, calcium, magnesium, and nitrate at PVNGS agricultural monitoring sites, 1990

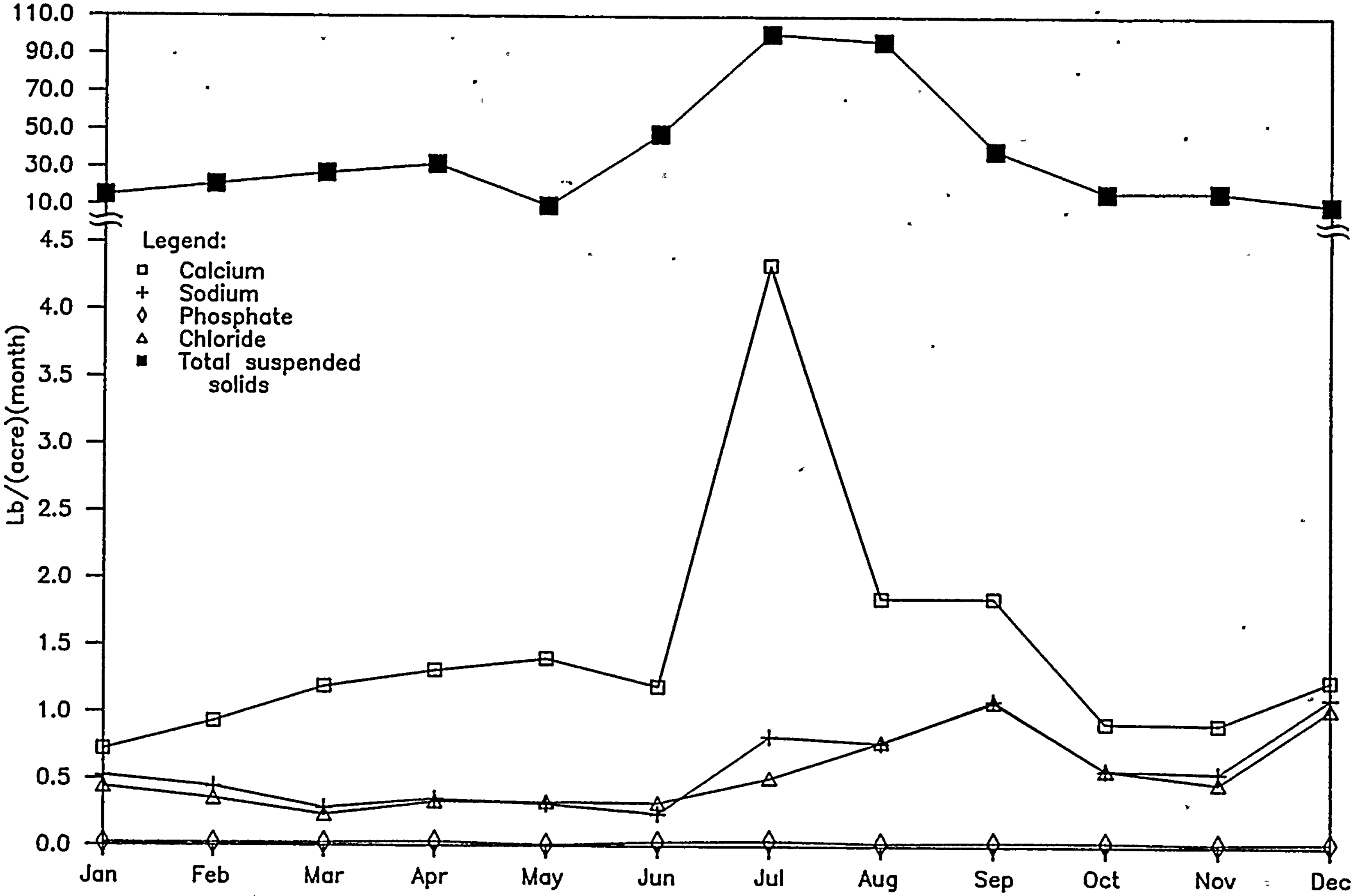

Figure 5–3. Mean monthly deposition of total suspended solids, calcium, sodium phosphate, and chloride at PVNGS native monitoring sites, 1990

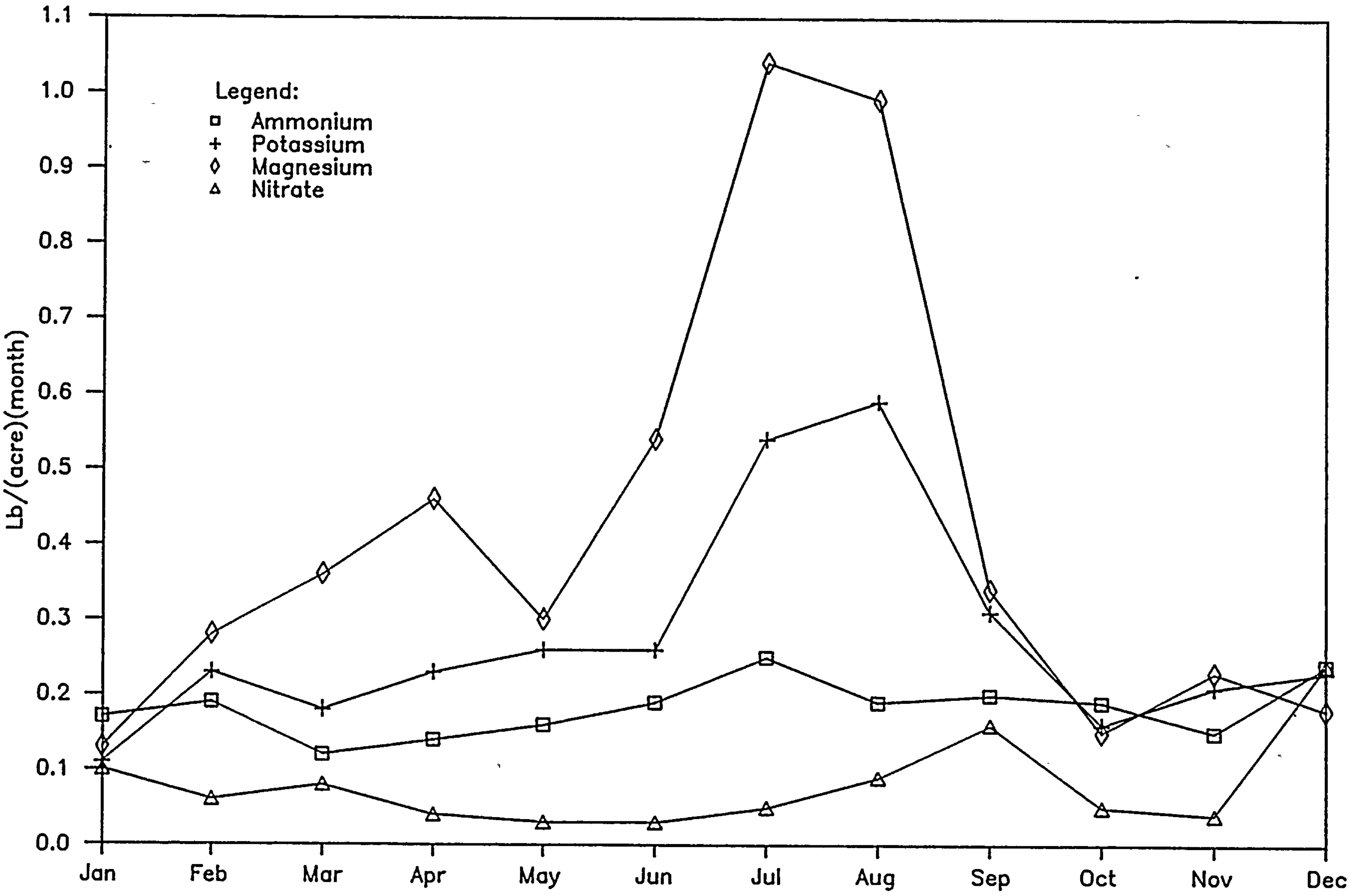

Figure 5–4. Mean monthly deposition of ammonium, potassium, magnesium, and nitrate at PVNGS native monitoring sites, 1990

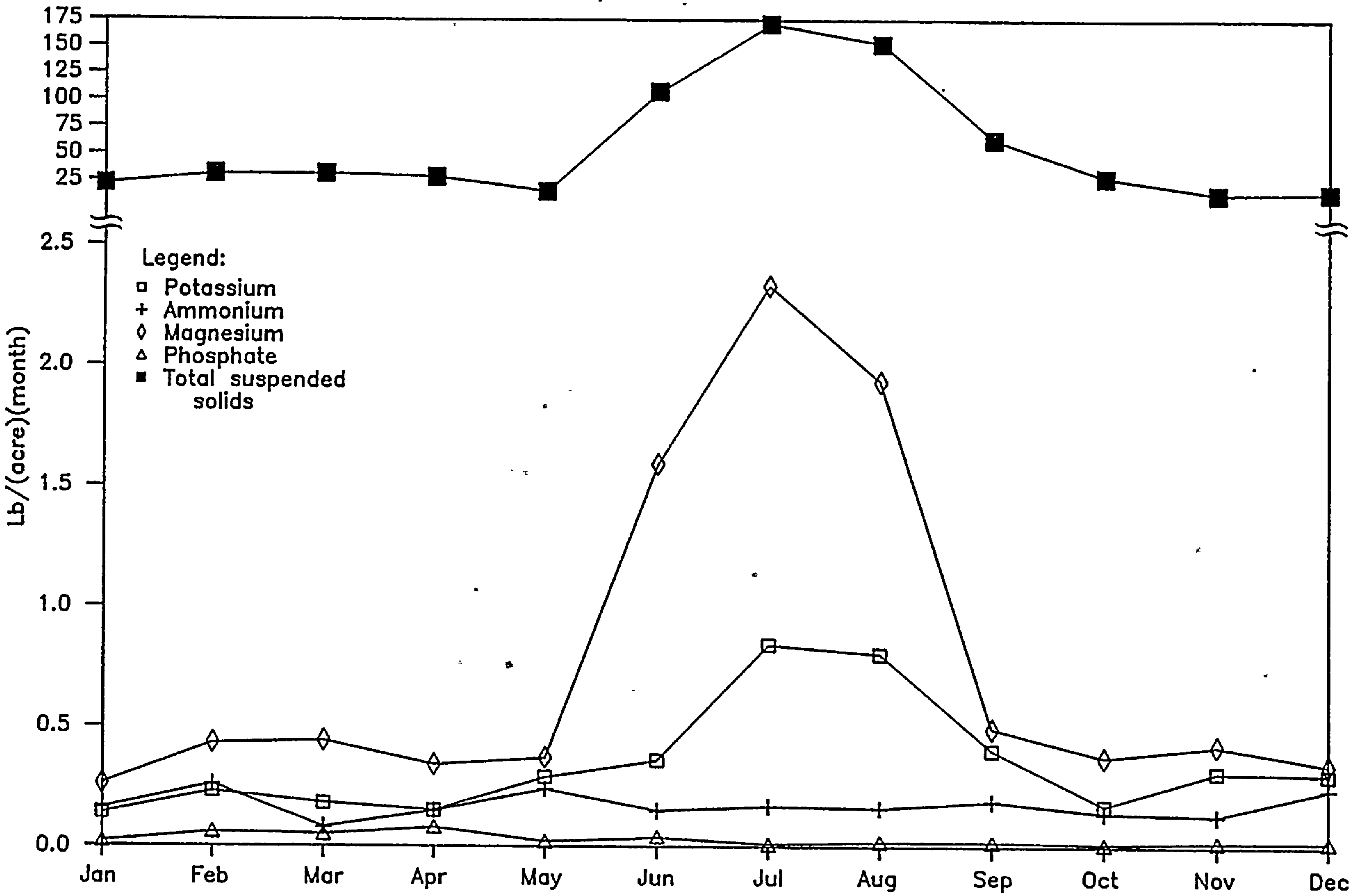

Figure 5–5. Mean monthly deposition of total suspended solids, potassium, ammonium, magnesium, and phosphate at PVNGS supplemental monitoring sites, 1990

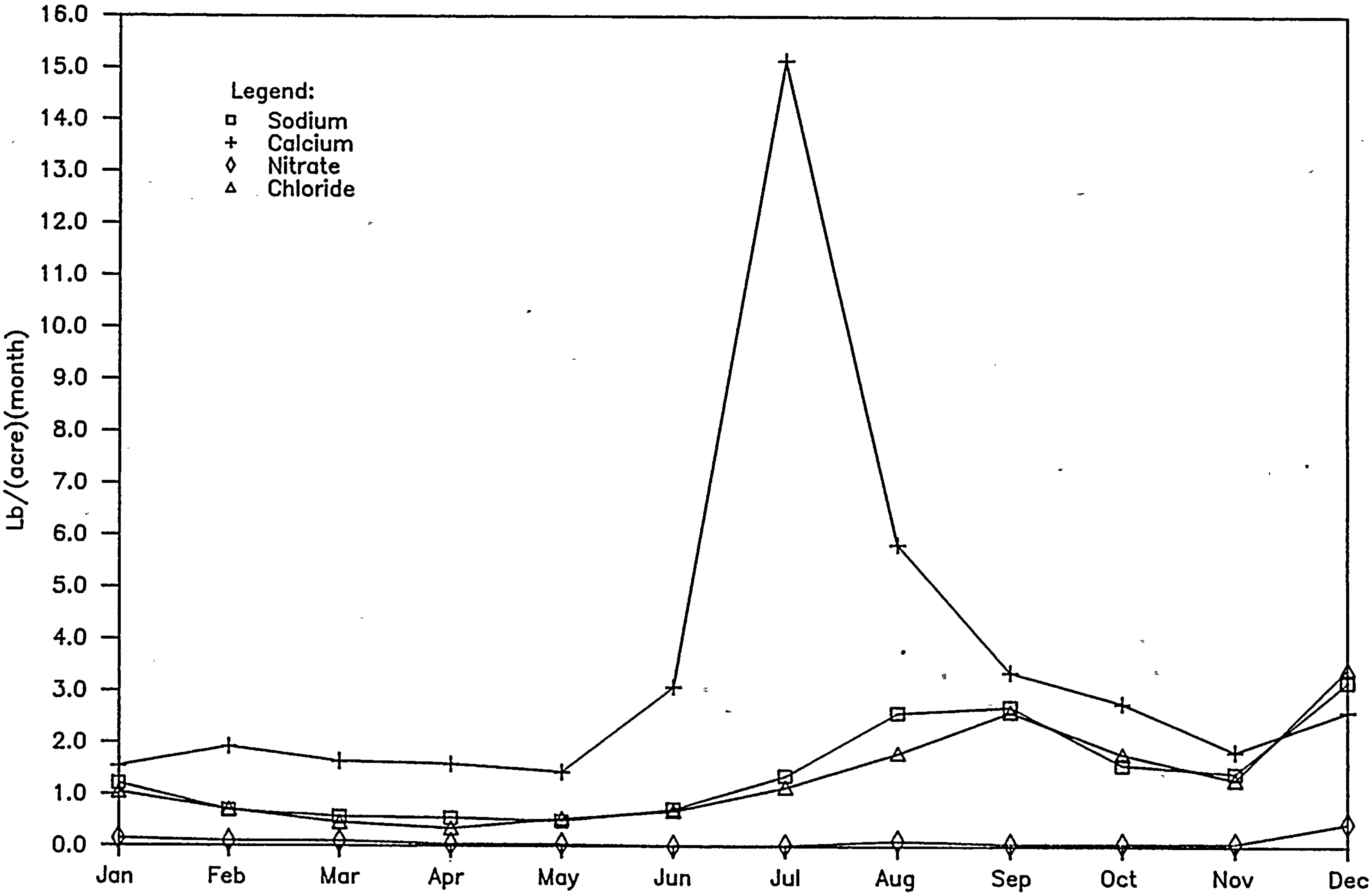

Figure 5-6. Mean monthly deposition of sodium, calcium, nitrate, and chloride at PVNGS supplemental monitoring sites, 1990

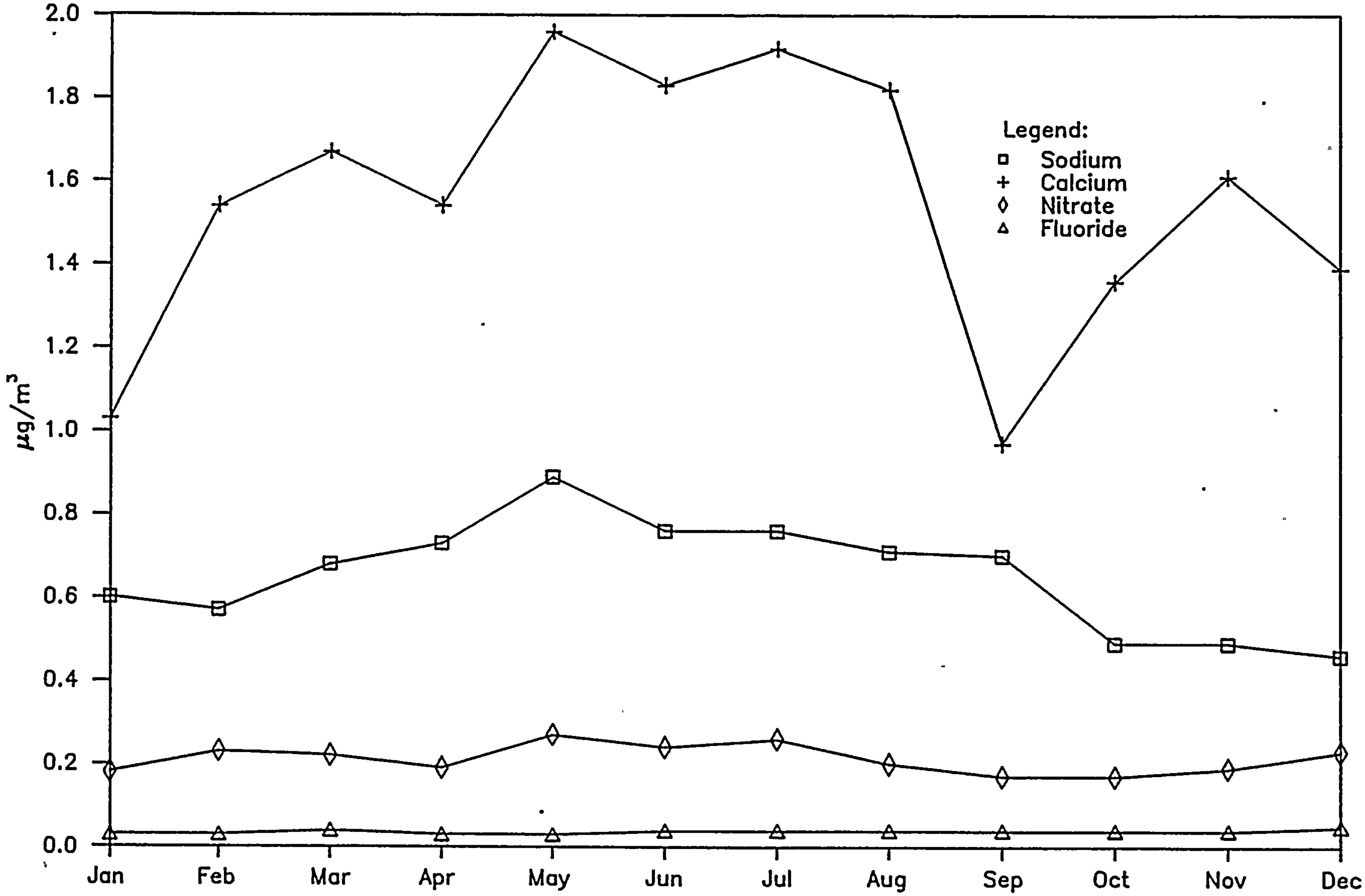

Figure 5–7. Mean monthly concentrations of sodium, calcium, nitrate, and fluoride in airborne particulate matter at PVNGS low–volume air sampler sites, 1990

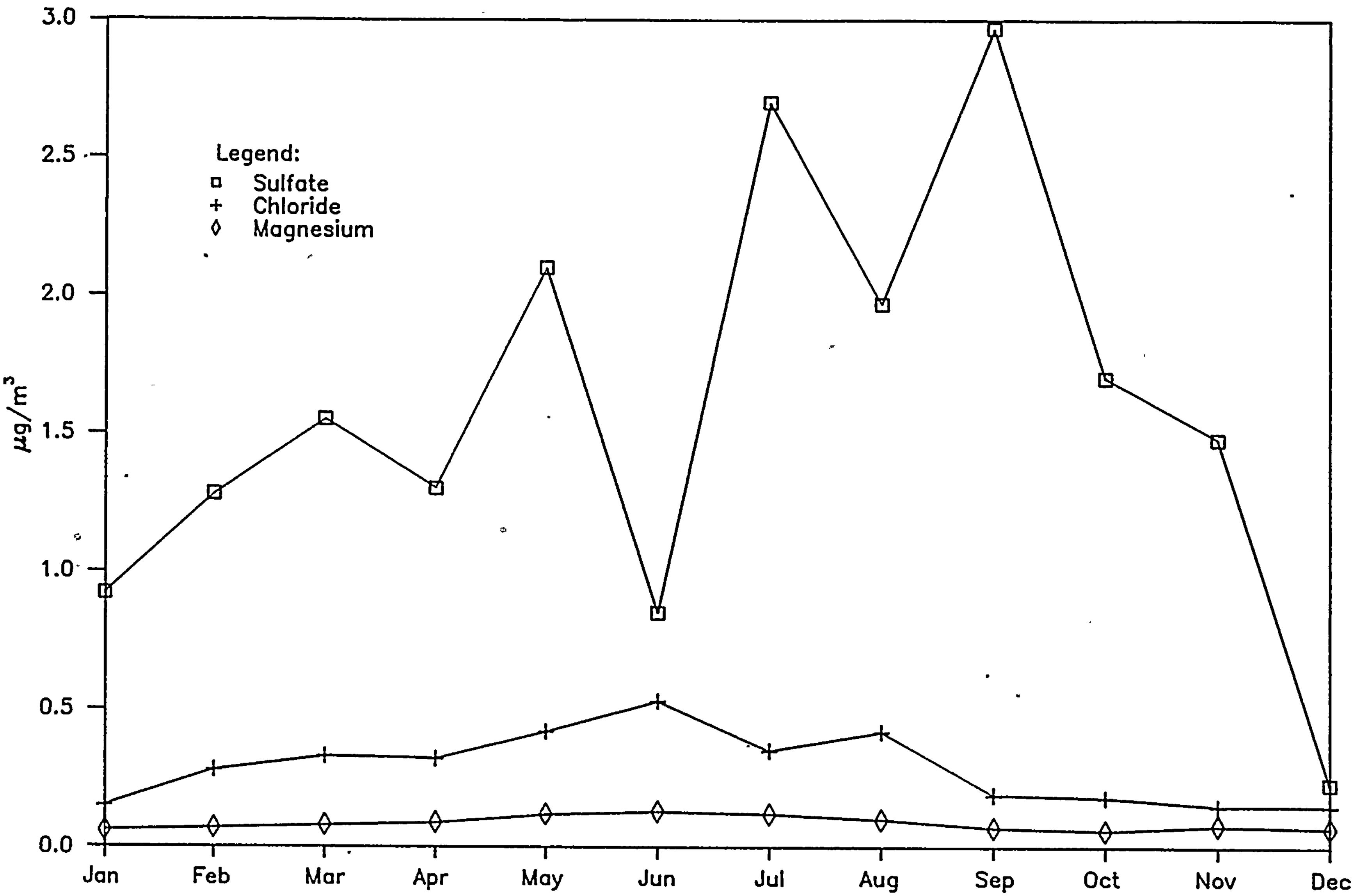

Figure 5–8. Mean monthly concentrations of sulfate, chloride, and magnesium in airborne particulate matter at PVNGS low–volume air sampler sites, 1990

6. Analyses of Agricultural Crops and Native Vegetation

6.1 CONCENTRATION OF SELECTED IONS IN LEAF TISSUE

Vascular plants require several nutrients for normal metabolic growth and acquire these from the air, water, and soil. The processes involved in the transport of a nutrient ion from the soil environment into the root and its translocation and distribution within the plant are complex and interrelated (Foth and Turk, 1972). The approach used here for evaluating the influence of cooling tower drift deposition on surrounding agricultural crops and indigenous flora is to identify and analyze ionic concentrations in cooling tower basin water, and to simultaneously monitor the same ionic concentrations in agricultural and indigenous leaf phytomass over time.

Leaf phytomass was sampled twice at each monitoring site in 1990: agricultural phytomass was taken during the middle (early July) and end (late August) of the growing season, and native phytomass was sampled during March and October. At each site a minimum of 20 grams wet weight of leaf tissue was collected from 10 plots each season. One split sample was taken at each site to evaluate laboratory accuracy. Leaf phytomass was analyzed for concentrations of four cations (sodium, potassium, calcium, and magnesium) and five anions (chloride, sulfate, nitrate, phosphate, and fluoride), and results were reported in micrograms per gram dry weight (parts per million).

The results of chemical analyses of leaf phytomass sampled during 1990 are presented in Appendixes E (native vegetation) and F (agricultural crops). Statistical analysis included factorial and one-way analyses of variance (ANOVAs) in a completely randomized design. For the factorial ANOVA, main effects included location and year. The following sections summarize these analyses, as well as analyses of cotton yield and the structure of native vegetation. Differences between means were identified by using the least-significant-difference multiple range test. Unless stated otherwise, differences are reported as significant when the probability is less than .05 (i.e., at the 95-percent confidence level). A comparison of the 1990 concentrations with preoperational (1983-1985) concentrations is given in Chapter 9.

6.1.1 Agricultural Crops

During the 1990 growing season, sites 7, 12, 24, 25, 28, 31, 32, and 45 were fallow (Figure 2-2). Of the remaining sites, one (i.e., 43) was planted in alfalfa and four (i.e., 11, 13, 23, and 30) in short-staple (i.e, upland) cotton. Long-staple (i.e., Pima) cotton was not planted at any of the sites in 1990.

6.1.1.1 Alfalfa

Only site 43 contained alfalfa in 1990. The results of the analyte analysis are presented in Table 6-1. Site 43, a control site, is about 15 miles south-southeast of PVNGS (Figure 2-2). Since alfalfa was only planted in one field, comparisons between locations are not possible; comparisons between 1990 and the preoperational monitoring period are presented in Chapter 9.

6.1.1.2 Cotton

Four agricultural monitoring sites containing short-staple cotton (i.e., sites 11, 13, 23, and 30) were sampled during the 1990 growing season. This was the first time since 1985 that monitoring site 23 was planted with short-staple cotton. It was also the first year since the study was initiated that site 25 was fallow.

The mean concentrations of analytes for short-staple cotton are presented in Table 6-2. Mean concentrations of sodium at sites 11, 13, and 23 were significantly higher than those at site 30. There was no significant difference between any of the sites in the mean concentrations of potassium, sulfate, nitrate, phosphate, and fluoride. Sites 13 and 23 had significantly higher levels of calcium than did site 11; calcium levels at site 30 were not significantly different from those at either site 11 or sites 13 and 23. The analysis of mean magnesium levels showed three overlapping groups of sites defined by relative magnesium concentration. These groups, from lowest concentration to highest, were sites 11 and 13, 13 and 30, and 30 and 23. Sites 11 and 23 showed the lowest and highest magnesium levels, respectively. Results for chloride indicate that site 13 had a significantly higher level than any other site.

6.1.2 Native Vegetation

6.1.2.1 Creosote Bush

The ionic content of creosote bush (Larrea divaricata) leaf tissue was measured at five locations in 1990. Sites 1, 4, and 6 are on PVNGS; sites 40 and 42, which serve as controls, are approximately 18 miles west-northwest and 17 miles south-southeast, respectively, of the station (Figure 2-2).

The analysis of mean sodium and potassium concentrations revealed three overlapping groups of sites where analyte levels were significantly different (Table 6-3). For sodium these groups, from lowest to highest, were sites 42 and 6; sites 6, 1, and 4; and sites 1, 4, and 40. Sites 42 and 40 had the lowest and highest sodium levels, respectively. In the case of potassium the three groups of sites, from lowest to highest, were sites 42 and 1; sites 1, 6, and 40; and sites 40 and 4. Mean concentrations of potassium were lowest at site 42 and highest at site 4. Mean concentrations of calcium also fell into three groups; however, they did not in each case overlap one another. From lowest calcium level to highest, the three groups were sites 4 and 40; sites 1 and 42; and sites 42 and 6. The lowest and highest mean calcium concentrations were recorded at sites 4 and 6, respectively. Levels of magnesium were significantly higher at site 6 than at sites 1, 4, 40, and 42, whose levels were not significantly different. Site 40 had significantly lower levels of chloride than any of the other locations, whose levels were not significantly different. Mean ionic concentrations of both sulfate and nitrate were not significantly different at any of the sites. While phosphate values were significantly lower at sites 1, 4, and 42 than at sites 6 and 40, they were not significantly different within each of these groups. Site 4 had significantly lower levels of fluoride than the remaining sites, whose levels did not differ significantly.

6.1.2.2 Salt Bush

The ionic content of salt bush (Atriplex polycarpa) was measured at three monitoring sites in 1990. Monitoring sites 2 and 3 are on PVNGS, whereas site 44, which serves as a control, lies approximately 6 miles northwest (Figure 2-2).

The mean concentrations of sodium, calcium, and chloride were significantly higher at sites 2 and 3 than at site 44 (Table 6-4). Conversely, levels of magnesium, sulfate, and phosphate were found to be significantly lower for the onsite locations than for the control site. Mean concentrations of potassium and nitrate were not significantly different at any of the sites. Fluoride levels were significantly different at each site, with site 3 having the lowest value and site 44 the highest.

6.2 COTTON YIELD

The mean yield of short-staple cotton in 1990 ranged from 2538 pounds per acre at monitoring site 13 to 3666 pounds per acre at site 23. Long-staple cotton was not planted at any of the monitored fields in 1990. These results and a comparison of the 1990 harvest with those of 1983-1985 are discussed in greater detail in Section 9.3.

6.3 STRUCTURE OF NATIVE PLANT COMMUNITIES

Species composition, relative cover, and diversity were quantitatively monitored in eight native plant communities on or in the vicinity of PVNGS in 1990 (Figure 2-2). Ten 1- by 10-meter plots were sampled during March and October within each community. Cover refers to the percentage of a line intersected by a given species; it is a measure of plant biomass. Two components of diversity were considered. The first, richness, refers to the number of species sampled from the community. The second, heterogeneity, incorporates both richness and equitability or evenness (Shannon and Weaver, 1949). Floristic nomenclature, which had followed Kearney and Peebles (1973), was updated in the 1989 Annual Report (Lehr, 1978; Lehr and Pinkava, 1980, 1982; and Turner, 1986). The updated nomenclature is presented in Table 6-5, which also lists all native vegetation observed to date. Except where noted, scientific names within the text and tables have not been changed in order to facilitate a comparison of this annual report with previous reports.

6.3.1 <u>Creosote Bush</u>

A comparison of the species composition, cover, and floristic diversity of five creosote bush communities is presented in Table 6-6. Monitoring sites

1, 4, and 6 are on PVNGS; control sites 40 and 42 are approximately 18 miles west-northwest and 17 miles south-southeast, respectively, from PVNGS (Figure 2-2).

Creosote bush was the dominant species at each of the five sites during both the spring and fall sampling periods; it characterized most of the native vegetation near PVNGS. Relative cover for this species at sites 1, 6, and 42 ranged from 12.8 to 14.6 percent, while at sites 4 and 40 it was 11.1 percent (Table 6-6). During most years, herbs and grasses are recorded primarily in the spring; however, as August and September of 1990 were wetter than normal (Table 9-1), a wide variety of these plants were seen during the fall. For example, in 1989 only 13 to 19 percent (depending on the site) of the number of species seen in the spring were recorded in the fall, while in 1990 the number was 38 to 78 percent. Woolly plantain (Plantago insularis) was the dominant vascular herbaceous species in 1990; however, it could not be considered abundant. Arabian grass (Schismus arabicus), a short, sparse grass, was the dominant grass present in 1990. Four species of cacti were observed in 1990; site 4 supported the greatest abundance and diversity.

Species richness within each of the five plant communities in 1990 was greater than that observed in 1989; it ranged from 15 to 22. A cumulative total of 39 species was observed in 1990. Monitoring site 4 showed the greatest richness, and it was followed in order by sites 1, 6, 42, and 40. Plant communities at PVNGS had species richness values that were higher than those of the control sites. Heterogeneity increased at sites 1, 4, and 42 in 1990; at sites 6 and 40 no meaningful change occurred. Although site 40 ranked low in species richness, it exhibited the greatest heterogeneity.

6.3.2 Salt Bush

Three salt bush (Atriplex spp.) communities were measured in 1990. Sites 2 and 3 are on PVNGS, while site 44, a control, is about 6 miles northwest of the station. Salt bush communities, which are fairly uncommon in the vicinity of PVNGS, were characterized by species of flora different from those in the creosote bush communities. Some species, however, were common to both communities.

Five species of perennial shrubs were identified from the three communities in 1990 (Table 6-7). Salt bush (Atriplex polycarpa) was the dominant perennial shrub in each of the communities. A second species of salt bush (Atriplex linearis) was present at sites 2 and 3, but it occurred much less frequently. More species of perennial shrubs were observed at monitoring site 2 than at sites 3 and 44. The dominant herbaceous species was the small-seeded sand mat (Euphorbia polycarpa), which was recorded exclusively during the fall sampling period. Also observed at sites 2 and 3 was a variety of fringed amaranth (Amaranthus fimbriatus var. denticulatus) that had previously been identified at only two other locations in Arizona. Arabian grass (Schismus arabicus) was the dominant grass; no cacti were observed.

Site 2 showed the greatest species richness, and sites 3 and 44 had similar but lower values. This pattern was also observed with respect to heterogeneity. The salt bush communities had a greater number of species of perennial shrubs than the creosote bush communities, but the creosote bush communities had more herbaceous species. A comparison of community structure in the preoperational and operational periods is presented in Section 9.3.2.

Table 6-1. Ion content (μg/g dry weight) of alfalfa leaf tissue at PVNGS agricultural monitoring site 43, 1990 (means ± standard errors)

Ion	Content
Sodium	1,669 ± 87
Potassium	24,925 ± 1,248
Calcium	13,802 ± 489
Magnesium	2,935 ± 99
Chloride	12,450 ± 357
Sulfate	9,066 ± 746
Nitrate (as N)	281 ± 58
Phosphate (as P)	3,793 ± 218
Fluoride	13.5 ± 0.1

Note: All values were derived from analysis of 20 samples.

Table 6-2. Ion content (μg/g dry weight) of short-staple cotton leaf tissue at PVNGS monitoring sites, 1990 (means ± standard errors)

Ion	Monitoring site			
	11	13	23	30
Sodium	3,307 ± 407^{a}	3,308 ± 397^{a}	2,892 ± 247^{a}	1,899 ± 143
Potassium	18,289 ± 910^{a}	17,750 ± 1,247^{a}	18,854 ± 872^{a}	19,683 ± 784^{a}
Calcium	39,675 ± 1,203^{a}	45,403 ± 2,073^{b}	46,831 ± 1,103^{b}	43,506 ± 1,614^{ab}
Magnesium	5,360 ± 220^{a}	5,954 ± 289^{ab}	6,805 ± 280^{c}	6,425 ± 215^{bc}
Chloride	16,790 ± 571^{a}	22,260 ± 814	16,704 ± 466^{a}	15,950 ± 417^{a}
Sulfate	40,214 ± 3,272^{a}	46,908 ± 2,594^{a}	43,426 ± 4,763^{a}	42,318 ± 3,611^{a}
Nitrate (as N)	117 ± 20^{a}	115 ± 30^{a}	276 ± 74^{a}	233 ± 72^{a}
Phosphate (as P)	2,308 ± 132^{a}	2,611 ± 205^{a}	2,403 ± 115^{a}	2,550 ± 128^{a}
Fluoride	16.3 ± 0.6^{a}	15.9 ± 0.4^{a}	15.5 ± 0.9^{a}	15.2 ± 1.0^{a}

Key: For individual ions, means with same superscript letter are not significantly different at 95-percent confidence level.

Note: All values were derived from analysis of 20 samples.

Table 6-3. Ion content (μg/g dry weight) of creosote bush (*Larrea divaricata*) leaf tissue at PVNGS monitoring sites, 1990 (means ± standard errors)

Ion	Monitoring site 1	4	6	40	42
Sodium	345 ± 19[bc]	356 ± 27[bc]	296 ± 23[ab]	361 ± 28[c]	280 ± 17[a]
Potassium	13,457 ± 451[ab]	16,214 ± 547[c]	14,025 ± 506[b]	14,726 ± 497[bc]	12,116 ± 631[a]
Calcium	18,102 ± 667[b]	15,549 ± 554[a]	19,790 ± 629[c]	16,094 ± 490[a]	18,543 ± 559[bc]
Magnesium	1,458 ± 53[a]	1,441 ± 40[a]	1,892 ± 99	1,570 ± 93[a]	1,489 ± 40[a]
Chloride	8,010 ± 358[a]	8,230 ± 366[a]	8,660 ± 285[a]	6,260 ± 219	8,900 ± 409[a]
Sulfate	3,685 ± 540[a]	5,519 ± 841[a]	4,113 ± 567[a]	4,647 ± 780[a]	4,715 ± 530[a]
Nitrate (as N)	121 ± 10[a]	157 ± 17[a]	151 ± 13[a]	122 ± 14[a]	130 ± 12[a]
Phosphate (as P)	1,383 ± 49[a]	1,426 ± 35[a]	1,729 ± 49[b]	1,739 ± 70[b]	1,362 ± 59[a]
Fluoride	17.3 ± 1.0[a]	14.0 ± 0.5	16.5 ± 0.6[a]	16.3 ± 0.6[a]	16.3 ± 0.2[a]

Key: For individual ions, means with same superscript letter are not significantly different at 95-percent confidence level.

Note: Except for sulfate, all values were derived from analysis of 20 samples. Numbers of sulfate samples were as follows: 13 at site 1; 16 at site 4; 18 at site 6; 11 at site 40; and 17 at site 42.

Table 6-4. Ion content (µg/g dry weight) of salt bush (<u>Atriplex</u> <u>polycarpa</u>) leaf tissue at PVNGS monitoring sites, 1990 (means ± standard errors)

Ion	Monitoring site 2	Monitoring site 3	Monitoring site 44
Sodium	64,625 ± 2,497[a]	67,500 ± 2,882[a]	40,522 ± 1,797
Potassium	20,504 ± 1,146[a]	22,800 ± 1,468[a]	21,435 ± 1,549[a]
Calcium	11,920 ± 673[a]	11,941 ± 990[a]	9,561 ± 375
Magnesium	5,538 ± 377[a]	5,571 ± 330[a]	6,696 ± 374
Chloride	56,354 ± 2,058[a]	61,894 ± 2,849[a]	42,778 ± 2,307
Sulfate	5,145 ± 469[a]	4,804 ± 513[a]	7,726 ± 675
Nitrate (as N)	271 ± 33[a]	237 ± 23[a]	270 ± 22[a]
Phosphate (as P)	1,349 ± 63[a]	1,269 ± 54[a]	1,575 ± 65
Fluoride	9.7 ± 0.3	9.1 ± 0.1	10.5 ± 0.3

Key: For individual ions, means with same superscript letter are not significantly different at 95-percent confidence level.

Note: All values were derived from analysis of 20 samples except that for sulfate at site 3, which was based on 18.

Table 6-5. Indigenous flora at PVNGS, 1983-1990: comprehensive list with updated nomenclature (sheet 1 of 5)

Scientific name*	Common name†	Updated nomenclature‡
Shrubs		
Ambrosia dumosa	White bursage	
Atriplex linearis	Salt bush; narrow-leaved wingscale	Atriplex canescens ssp. linearis
Atriplex polycarpa	Salt bush; all scale	
Larrea divaricata	Creosote bush; greasewood	Larrea divaricata var. tridentata
Lycium Fremontii	Fremont thornbush	
Lycium Parishii	Parish thornbush	
Lycium sp.	Wolfberry; desert thorn	
Prosopis velutina	Velvet mesquite	
Herbs		
Abronia villosa	Hairy sand verbena	
Allionia incarnata	Trailing four-o'clock	
Amaranthus fimbriatus	Fringed amaranth	
Amsinckia intermedia	Coast fiddleneck	
Argythamnia neomexicana	None	
Astragalus Nuttallianus	None	
Boerhaavia intermedia	Five-winged ringstem	
Bowlesia incana	Hairy bowlesia	
Brassica Tournefortii	Mustard	
Camelina microcarpa	Little pod	
Chaenactis carphoclinia	Pebble pincushion	
Chaenactis Fremontii	Fremont pincushion	
Chorizanthe brevicornu	Brittle spine flower	
Chorizanthe rigida	Rigid spiny herb	
Cryptantha angustifolia	Narrow-leaved cryptantha	
Cryptantha inaequata	Darwin cryptantha	

Table 6-5. Indigenous flora at PVNGS, 1983-1990: comprehensive list with updated nomenclature (sheet 2 of 5)

Scientific name*	Common name†	Updated nomenclature‡
Cryptantha maritima	White-haired cryptantha	
Cryptantha muricata	None	
Cryptantha pterocarya	None	
Cryptantha sp.	None	
Dalea mollis	Silk dalea	
Dalea neomexicana	Indigo bush; pea bush	
Daucus pusillus	American carrot	
Eremalche exilis	None	
Eriastrum diffusum	None	
Erigeron lobatus	Fleabane	
Eriogonum Thomasii	Thomas eriogonum	
Eriogonum trichopes	Little trumpet	
Eriophyllum lanosum	Woolly eriophyllum	
Erodium cicutarium	Filaree; heron bill	
Erodium texanum	Large-flowered stork's bill; heron bill	
Eucrypta micrantha	Small-flowered eucrypta	
Euphorbia capitellata	Spurge	
Euphorbia polycarpa	Small-seeded sand mat	
Euphorbia sp.	Spurge	
Filago arizonica	Arizona filago	
Hesperocallis undulata	Desert lily	
Krameria sp.	Ratany	
Lepidium lasiocarpum	Sand pepper grass	
Lepidium virginicum	Pepper grass; pepperwort	
Lepidium sp.	Pepper grass; pepperwort	
Lesquerella Gordoni	Gordon bladderpod	
Linanthus bigelovii	None	

Table 6-5. Indigenous flora at PVNGS, 1983-1990: comprehensive list with updated nomenclature (sheet 3 of 5)

Scientific name*	Common name†	Updated nomenclature‡
Linanthus dichotomus	Evening snow	
Lotus salsuginosus	Deer vetch	
Lotus tomentellus	Hairy lotus	Lotus strigosus var. tomentellus
Lupinus sparsiflorus	Lupine	Lupinus sparsiflorus ssp. mohavensis
Machaeranthera arida	None	Machaeranthera Coulteri var. arida
Machaeranthera Coulteri	None	Machaeranthera Coulteri var. arida
Monoptilon bellioides	Mohave desert star	
Nama demissum	Purple mat	
Nama hispidum	None	
Nemacladus glanduliferus	Thread plant	
Oenothera sp.	Evening primrose; sun drops	
Oligomeris linifolia	Linear-leaved cambess	
Orthocarpus purpurascens	Mohave owl clover	
Pectis papposa	Chinchweed	
Pectocarya platycarpa	Broad-nutted comb bur	
Perityle Emoryi	Emory rock daisy	
Phacelia crenulata	None	
Pholistoma auritum	None	
Plantago insularis	Woolly plantain, Indian wheat	
Portulaca parvula	Purslane	
Proboscidea altheaefolia	Desert unicorn plant; elephant tusks	
Salsola Kali§	Russian thistle	
Sisymbrium Irio	London rocket	
Spermolepis echinata	Scale seed	
Sphaeralcea Coulteri	Coulter globe mallow	
Sphaeralcea sp.	Alkali pink	

Table 6-5. Indigenous flora at PVNGS, 1983-1990: comprehensive list with updated nomenclature (sheet 4 of 5)

Scientific name*	Common name†	Updated nomenclature‡
Tidestromia lanuginosa	Woolly tidestromia	
Trianthema Portulacastrum	Horse purslane	
Grasses		
Aristida adscensionis	Six weeks three-awn	
Aristida sp.	Three-awn	
Bouteloua barbata	Six-weeks grama	
Bromus rubens	Red brome; foxtail chess	
Erioneuron pulchellum	Fluff grass	
Festuca octoflora	Six-weeks fescue	Vulpia octoflora
Muhlenbergia microsperma	Littleseed muhly	
Schismus arabicus	Arabian grass	
Schismus barbatus	Meditteranean grass	
Schismus sp.	None	

Table 6-5. Indigenous flora at PVNGS, 1983-1990: comprehensive list with updated nomenclature (sheet 5 of 5)

Scientific name*	Common name†	Updated nomenclature‡
Cacti		
Echinocereus Engelmannii	Hedgehog cactus; strawberry cactus	
Ferocactus Wislizeni	Barrel cactus	
Opuntia acanthocarpa	Buckhorn cholla	
Opuntia echinocarpa	Silver cholla; golden cholla	
Opuntia leptocaulis	Desert Christmas cactus	
Opuntia ramosissima	Diamond cholla	

* From Kearney and Peebles, 1973.

† Updated using Lehr, 1978.

‡ From Lehr, 1978; Lehr and Pinkava, 1980, 1982; and Turner, 1986.

§ Until recently Salsola Kali was the only species of Salsola listed in Arizona; however, there are now two species listed: Salsola iberica and Salsola paulsenii. Future field work may determine if one or both of these species are present within study plots.

Table 6-6. Species composition, cover, and diversity of flora in five creosote bush (*Larrea divaricata*) communities at PVNGS monitoring sites, 1990 (sheet 1 of 3)

Parameter		Site 1	4	6	40	42	Cumulative total
		Species composition and percent cover					
Shrubs							
*Ambrosia dumosa**	White bursage†	1.6					1.6
Larrea divaricata	Creosote bush; greasewood	13.0	11.1	14.6	11.1	12.8	62.6
Herbs							
Allionia incarnata	Trailing four-o'clock		--		2.6		2.6
Amsinckia intermedia	Coast fiddleneck	<0.1		0.1	<0.1	<0.1	0.2
Argythamnia neomexicana	None	--					--
Astragalus Nuttallianus	None	--	--	<0.1		<0.1	<0.1
Brassica Tournefortii	Mustard				--		--
Chaenactis carphoclinia	Pebble pincushion	--	--				--
Chorizanthe brevicornu	Brittle spine flower						--
Chorizanthe rigida	Rigid spiny herb		<0.1	--		--	<0.1
Cryptantha maritima	White-haired cryptantha					<0.1	<0.1
Dalea mollis	Silk dalea			<0.1		--	<0.1
Daucus pusillus	American carrot	0.3					0.3
Eriogonum trichopes	Little trumpet		<0.1	<0.1	--	0.5	0.5
Erodium cicutarium	Filaree; heron bill	0.2		<0.1			0.2
Erodium texanum	Large-flowered stork's bill; heron bill	0.1	0.1			<0.1	0.2

Table 6-6. Species composition, cover, and diversity of flora in five creosote bush (<u>Larrea divaricata</u>) communities at PVNGS monitoring sites, 1990 (sheet 2 of 3)

Parameter		Site 1	Site 4	Site 6	Site 40	Site 42	Cumulative total
Species composition and percent cover (continued)							
Herbs (continued)							
Euphorbia polycarpa	Small-seeded sand mat	0.1	--	0.3	0.5	--	0.9
Hesperocallis undulata	Desert lily		<0.1				<0.1
Lepidium lasiocarpum	Sand pepper grass	0.1	<0.1	<0.1	--	0.4	0.5
Lesquerella Gordoni	Gordon bladderpod		0.2		--	--	0.2
Lupinus sparsiflorus	Lupine			--			--
Monoptilon bellioides	Mohave desert star			--			--
Pectis papposa	Chinchweed	--	<0.1	<0.1	0.1		0.2
Pectocarya platycarpa	Broad-nutted comb bur	<0.1	<0.1	0.1	<0.1	<0.1	0.2
Phacelia crenulata	None	<0.1	<0.1				<0.1
Plantago insularis	Woolly plantain; Indian wheat	0.1	0.9	0.9	<0.1	2.5	4.4
Sphaeralcea sp.	Alkali pink				0.1		0.1
Tidestromia lanuginosa	Woolly tidestromia		--		0.4		0.4
Grasses							
Aristida adscensionis	Six weeks three-awn	<0.1	--	0.5		--	0.5
Bouteloua barbata	Six-weeks grama	0.6	--	--	--		0.6
Bromus rubens	Red brome; foxtail chess		--				--
Erioneuron pulchellum	Fluff grass	--					--

Table 6-6. Species composition, cover, and diversity of flora in five creosote bush (Larrea divaricata) communities at PVNGS monitoring sites, 1990 (sheet 3 of 3)

Parameter		Site 1	Site 4	Site 6	Site 40	Site 42	Cumulative total
Species composition and percent cover (continued)							
Grasses (continued)							
Festuca octoflora	Six-weeks fescue	<0.1		0.2		--	0.2
Muhlenbergia microsperma	Littleseed muhly	--					--
Schismus arabicus	Arabian grass	<0.1	0.3	0.3	0.6	1.0	2.2
Cacti							
Opuntia acanthocarpa	Buckhorn cholla		--			--	--
Opuntia echinocarpa	Silver cholla; golden cholla		0.1				0.1
Opuntia leptocaulis	Desert Christmas cactus	--					--
Opuntia ramosissima	Diamond cholla		0.9			--	0.9
Species diversity and number of plots							
Species richness		21	22	20	15	18	39
Heterogeneity (H')		.33	.35	.29	.42	.38	NA
Plots		20	20	20	20	20	100

Key: -- (dash), species present in plot but not on transect; NA, not applicable.

*Scientific name.

†Common name.

Table 6-7. Species composition, cover, and diversity of flora in three salt bush (Atriplex spp.) communities at PVNGS monitoring sites, 1990 (sheet 1 of 2)

Parameter		Site 2	Site 3	Site 44	Cumulative total
Species composition and percent cover					
Shrubs					
*Atriplex linearis**	Salt bush; narrow-leaved wingscale[†]	0.4	1.2		1.6
Atriplex polycarpa	Salt bush; all scale	16.6	18.0	8.3	42.9
Larrea divaricata	Creosote bush; greasewood	4.3		0.6	4.9
Lycium Fremontii	Fremont thornbush	0.4	4.4		4.8
Prosopis velutina	Velvet mesquite	5.7	--	1.4	7.1
Herbs					
Allionia incarnata	Trailing four-o'clock	0.1			0.1
Amaranthus crassipes	Amaranth; pig weed	--			--
Amaranthus fimbriatus	Fringed amaranth	<0.1	--		<0.1
Amsinckia intermedia	Coast fiddleneck			--	--
Boerhaavia intermedia	Five-winged ringstem	0.4			0.4
Eremalcha exilis	None			--	--
Eriogonum trichopes	Little trumpet			--	--
Euphorbia polycarpa	Small-seeded sand mat	6.5	1.4	0.6	8.5
Lepidium lasiocarpum	Sand pepper grass	--	<0.1	<0.1	<0.1
Oligomeris linifolia	Linear-leaved cambess		<0.1		<0.1
Pectis papposa	Chinchweed	0.4	1.4	0.1	1.9
Plantago insularis	Woolly plantain; Indian wheat	0.1	<0.1	--	0.1
Portulaca parvula	Purslane	--	--		--
Sphaeralcea Coulteri	Coulter globe mallow	--			--

Table 6-7. Species composition, cover, and diversity of flora in three salt bush (Atriplex spp.) communities at PVNGS monitoring sites, 1990 (sheet 2 of 2)

Parameter		Site 2	Site 3	Site 44	Cumulative total
Species composition and percent cover (continued)					
Herbs (continued)					
Sphaeralcea sp.	Alkali pink	0.3	--	<0.1	0.3
Tidestromia lanuginosa	Woolly tidestromia	--		<0.1	<0.1
Trianthema Portulacastrum	Horse purslane		<0.1		<0.1
Grasses					
Bouteloua barbata	Six-weeks grama	0.4	0.8		1.2
Schismus arabicus	Arabian grass	0.7	0.8	2.1	3.6
Schismus sp.	None	<0.1			<0.1
Species diversity and number of plots					
Species richness		20	15	13	25
Heterogeneity (H')		.70	.54	.51	NA
Plots		20	20	20	60

Key: -- (dash), species present in plot but not on transect; NA, not applicable.

*Scientific name.

†Common name.

7 Detection of Vegetative Stress Using Remote Sensing

The chemical monitoring of ionic concentrations in leaf phytomass during the growing season is an effective means of detecting physiological changes in vegetation, including vegetative stress. This component of the PVNGS monitoring program is discussed in Sections 6.1 and 9.3 of this report. Another technique to detect vegetative stress, and one which complements the chemical analysis, is remote sensing with color infrared (CIR) aerial photography. The infrared band of the electromagnetic spectrum exhibits a high level of reflectivity from living vegetation and thus can be used to identify physiological and morphological changes in such vegetation. On CIR imagery, more robust growth is generally indicated by reddish hues and less vigorous growth by lighter hues. Color infrared photography is especially useful for detecting vegetative stress in homogeneous assemblages of broad-leaved plants such as cotton. It is more limited in applicability to studies of native vegetation having sclerophyllous leaves, such as Sonoran desert flora.

Vegetative stress in agricultural crops and indigenous vegetation is attributable to drought, poor drainage, nutrient deficiencies associated with varying soil fertility, disease or insect damage, competition from weeds, or other conditions that alter the normal physiology of a plant. Symptoms associated with salt deposition or uptake include chlorosis and necrosis of the leaves, shoot-tip dieback, leaf curl, slower growth, increased susceptibility to disease and insect damage, and changes in structure and diversity in the plant community over time (Foster et al., 1984). Significant stress of agricultural crops and native plant communities from salt drift dispersion would appear on the CIR imagery as a homogeneous tonal signature covering an entire field or a large portion thereof.

The environment within a 5-mile radius of the PVNGS cooling towers, as well as the control sites, was aerially photographed with CIR film on August 28, 1990. The flight line index for the photomission is shown in Figure 7-1, and mission specifications and associated data are given in Table 7-1. Color infrared transparencies were examined over a Richards elevated light table

(Model GFL-940 MCE) using a Bausch and Lomb stereo zoom (X0.7-X3.0) microscope. Exposures were examined for quality (i.e., color, resolution, scale, cloud cover) and changes in color, tone, and pattern (i.e., signatures). Color-positive prints were made of all agricultural and native sites. Sites were ground-truthed on September 21, 1990. Ground verification efforts included (1) observation of species present and general vegetative health, (2) examination of plant parts and tissue for visible symptoms, (3) comparison of plant conditions within and outside the study area, (4) documentation of the location, extent, and severity of stressed areas, (5) examination of the locations of stressed areas in relation to depositional predictions, and (6) interviews with local farmers. All of these factors were weighted to determine if observed stress was attributable to cooling tower drift deposition.

Representative CIR photographs for sites 11 and 13 are included in Appendix H. As was the case in 1989 (NUS, 1990), site 11 exhibited evidence of Texas root rot along the eastern border of the field. Texas root rot, which is caused by a fungus (Phymatotrichium omnivorum), is characterized on the CIR imagery by circular or partially circular outlines of bare soil (i.e., dead plants) within the field. Also seen again in 1990 was the pinkish area south of site 11, which is an area of common cocklebur (Xanthium saccharatum). The cotton field northwest of site 11 exhibited a somewhat lighter pink color than normal, especially in the southeast corner, indicating a possible stressed condition. Ground-truthing suggested a possible nitrogen deficiency. The farmer responsible for this field also felt that a lack of sufficient nitrogen was a problem with this particular field. There was little variation in tonal signature in the area of site 13. Variations that were present are attributable to inconsistent germination.

Examination of the CIR photography and ground-truthing did not reveal any evidence of salt stress in any of the agricultural fields. However, all fields showed evidence of insect pests, including pink bollworms (Pectinophora gossypiella), sweet potato whiteflies (Bemisia tabaci), and cotton leaf perforators (Bucculatrix thurberiella). Whiteflies and/or leaf perforators were especially abundant around sites 11, 13, and 23 (site 30

had been defoliated, and thus the status of insect pests was not readily discernible). Inconsistent growth was also noted in several fields.

Examination of CIR aerial photography revealed that native vegetation was in a more active state of growth than is normally seen during the late summer photo mission. This is a result of the above-average rainfall that occurred during the summer months. Neither CIR photography nor observations in the field yielded any evidence of salt damage from cooling tower drift.

Table 7-1. Summary of 1990 color infrared photomission at PVNGS and vicinity

Subcontractor	Aero/Science P.O. Box 4 Scottsdale, AZ 85252 (602) 948-6634
Date	August 28, 1990
Weather	Clear
Start time	10:25 a.m. Mountain Standard Time
Stop time	12:02 p.m. Mountain Standard Time
Altitude	3000 ft above ground level
Film type	Eastman Kodak 2443 Color Infrared
Camera serial number	RC8 925
Magazine serial number	995
Lens serial number	UAG 414
Camera focal length	152.22 mm
Filter	BL (minus blue)
Shutter speed	1/350 sec
Aperture	F6.8
Scale	1:6000

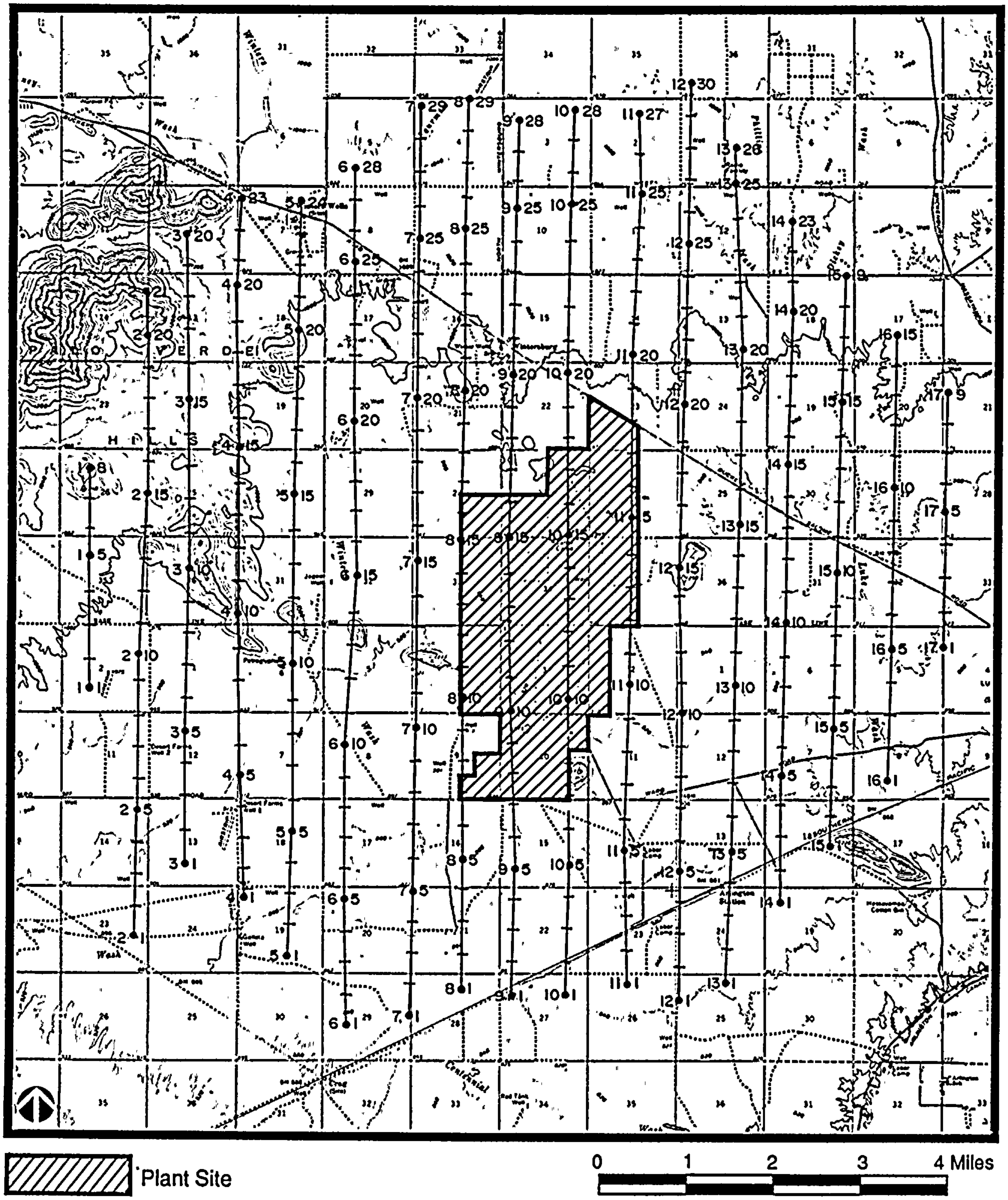

Figure 7-1. Orientation of flight lines of 1990 PVNGS color infrared aerial photomission

8 Soil Analyses

8.1 PHYSICAL ANALYSES

Soil samples collected from each site were analyzed in 1983 to determine their textural classification. The results of these analyses for the upper (0- to 15-centimeter) and lower (15- to 30-centimeter) sample segments are reported in Appendix G. Six inches (15 centimeters) was selected as the break point between the upper and lower sample segments because of the textural changes observed at this level at about one-half of the sites, and because hardpan layers form in these soils at about the 6-inch (15-centimeter) depth. The predominant texture of soils from agricultural sites is sandy loam, followed by loam and silt loam. Sites 33 and 35 have sand to loamy sand textures. Site 33 is located in a small sand dune and site 35 in the Hassayampa River floodplain. The finest-textured soil is found at site 45. No new physical analyses were performed in 1990.

8.2 CHEMICAL ANALYSES

8.2.1 Comparisons of Agricultural and Native Sites, 1990

Twelve soil samples were taken from each agricultural site in 1990: two replications (transects) for each of two depths for each of three seasons (wet, dry, and postdefoliation). Similarly, eight samples were taken from each native site: two replications for each of two depths for each of two seasons (wet and dry). A total of 156 agricultural samples (13 sites) and 248 native samples (31 sites) were collected and analyzed. Analytical results are presented in Appendix G.

Annual mean data for each measured parameter for the agricultural and the native soils are presented in Table 8-1. The means of the two groups were significantly different for 11 of the 19 measured parameters: pH, soluble magnesium, fluoride, bicarbonate, carbonate, ammonium, phosphate, sulfate, exchangeable calcium, exchangeable magnesium, and exchangeable sodium. Where significantly different, the parameter values were greater in agricultural soils than in native soils, except for phosphate and exchangeable calcium.

Such a trend is expected given the input of chemicals that agricultural soils receive from fertilizer and irrigation water.

8.2.2 Ion Comparisons of Agricultural Soils

Table 8-2 presents the annual mean values for individual parameters for the upper and lower soil depths at the agricultural sites. There were significant differences, as determined by the t-test, between the two depths only for fluoride and phosphate. The prevailing trend of no significant difference between the upper and lower depths is expected due to the mixing of soil layers as a result of agricultural practices.

Table 8-3 presents mean values for each parameter when upper and lower depth samples are averaged by season: April (following the wet season), July (following the dry season), and November (following cotton defoliation). A comparison of wet and dry season concentrations revealed a significant difference in the means for carbonate and ammonium. The values for both carbonate and ammonium were significantly higher in July than in April. Ammonium was significantly higher in both July and November than in April. In terms of dry season and postdefoliation parameter concentrations, significant differences were revealed for phosphate, exchangeable calcium, and exchangeable magnesium. While phosphate was significantly higher in November than in July, both exchangeable calcium and exchangeable magnesium were significantly lower in November than in both April and July.

The annual mean value for each parameter by site is presented in Table 8-4. Sites 7, 11, 12, 24, 25, 28, 30, 31, 32, and 45 were fallow in 1990. Sites 13 and 23 were planted in cotton and site 43 in alfalfa. Most sites were in the same condition in 1990 as they were in 1988 and 1989, with the exception of sites 11, 23, 25, 30, and 31. Sites 11, 25, and 30 were planted in cotton during 1988-1989 while site 23 was planted in alfalfa in 1988 and cotton in 1989. Site 31 was planted in cotton in 1988 and was fallow in 1989. A least-significant-difference (LSD) procedure was used to segregate the sites into homogeneous units based on the concentration of each parameter. The procedure also made it possible to identify statistical outliers. These statistical groupings are indicated by superscript in Table 8-4. By any reasonable use of statistical measures, no agricultural site can be judged,

overall, to be significantly different from the others in the monitoring program. Sites 12 and 25, nevertheless, did show significantly higher readings for several parameters each as compared to all others in 1990. Site 12 had the significantly highest readings for electrical conductivity, soluble sodium, soluble potassium, chloride, and nitrate, and site 25 had the significantly highest concentrations for soluble calcium, soluble magnesium, and sulfate.

Figure 8-1 illustrates the concentration of sodium at individual agricultural sites for each depth and season. Sodium was considered the best indicator because it is an important constituent of the cooling tower basin water and is found at concentrations above the detection limit in deposition samples. The upper and lower samples from site 7, for example, had mean concentrations of 120 and 148 parts per million of soluble sodium, respectively, in the wet season. In 13 of the 39 samplings (that is, 13 sites for 3 seasons) represented in Figure 8-1, the soluble sodium concentration is greater in the upper-depth segment than in the lower-depth segment.

8.2.3 Ion Comparisons of Native Soils

Mean values for parameters measured in the upper and lower soil samples collected from native sites are also shown in Table 8-2. The samples differed significantly by depth for most parameters: electrical conductivity, soluble sodium, chloride, boron, fluoride, carbonate, nitrate, phosphate, sulfate, and exchangeable sodium. For all parameters exhibiting significant differences, with the exception of phosphate, mean parameter values were higher in the lower-depth samples.

The distribution of soluble sodium by depth at each native site is shown in Figure 8-2. Sodium concentrations were, almost invariably, greater in the lower-depth samples in native soils. Exceptions were the dry season samples from sites 26 and 42.

Sites 3 and 16, both onsite locations, had much higher concentrations of sodium than the other sites. This trend has been consistent throughout the monitoring program. These sites are within 2000 feet of each other in the

northwest section of the PVNGS site. As indicated by the Soil Conservation Service (USDA, 1977), sites 3 and 16 are located in an area of naturally saline soils (Casa Grande-Laveen Complex) which indicates that the amount of sodium measured at these sites reflects naturally occurring conditions.

Table 8-1. Chemical properties of agricultural and native soils at PVNGS monitoring sites, 1990 (means ± standard errors)

Parameter	Agricultural soils (n = 156)	Native soils (n = 248)
Electrical conductivity* (mmhos/cm)	1.36 ± 0.06	1.10 ± 0.13
pH (units)	8.74 ± 0.03	8.62 ± 0.02
Soluble ions (ppm)		
Calcium*	50.3 ± 3.4	56.7 ± 5.4
Magnesium	7.8 ± 0.6	6.2 ± 0.4
Sodium*	250 ± 10	204 ± 33
Potassium*	21.9 ± 1.6	24.7 ± 2.0
Chloride*	180 ± 14	191 ± 32
Boron*	2.2 ± 0.1	2.8 ± 0.5
Fluoride	5.3 ± 0.3	1.1 ± 0.1
Bicarbonate	266 ± 6	186 ± 4
Carbonate	7.8 ± 0.8	5.8 ± 0.6
Nitrate (as N)*	24.9 ± 1.9	23.9 ± 3.4
Ammonium (as N)	2.7 ± 0.2	2.2 ± 0.1
Phosphate (as P)	2.0 ± 0.1	2.3 ± 0.1
Sulfate	151 ± 11	54 ± 9
Exchangeable ions (meq/100g)		
Calcium	23.7 ± 0.4	25.8 ± 0.5
Magnesium	2.2 ± 0.1	1.9 ± 0.1
Sodium	3.0 ± 0.1	1.9 ± 0.2
Potassium*	1.2 ± 0.1	1.3 ± 0.1

*For this parameter, means for agricultural and native soil samples are <u>not</u> significantly different at 95-percent confidence level.

Table 8-2. Chemical properties of soil samples collected at two depths at PVNGS agricultural and native monitoring sites, 1990 (means ± standard errors) (sheet 1 of 2)

Parameter	Depth	Agricultural soils (n = 78)	Native soils (n = 124)
Electrical conductivity*	U	1.33 ± 0.08	0.72 ± 0.09
(mmhos/cm)	L	1.39 ± 0.08	1.48 ± 0.23
pH (units)*†	U	8.72 ± 0.05	8.59 ± 0.02
	L	8.76 ± 0.05	8.65 ± 0.03
Soluble ions (ppm)			
Calcium*†	U	52.2 ± 5.0	52.9 ± 6.4
	L	48.4 ± 4.7	60.5 ± 8.8
Magnesium*†	U	8.4 ± 0.9	5.7 ± 0.4
	L	7.3 ± 0.7	6.7 ± 0.6
Sodium*	U	239 ± 15	102 ± 20
	L	262 ± 14	305 ± 63
Potassium*†	U	23.4 ± 2.2	25.0 ± 2.8
	L	20.3 ± 2.5	24.5 ± 2.8
Chloride*	U	170 ± 19	106 ± 24
	L	191 ± 21	276 ± 58
Boron*	U	2.2 ± 0.1	1.6 ± 0.3
	L	2.1 ± 0.1	4.1 ± 1.0
Fluoride	U	4.4 ± 0.3	0.7 ± 0.1
	L	6.1 ± 0.4	1.5 ± 0.3
Bicarbonate*†	U	273 ± 9	183 ± 5
	L	259 ± 8	190 ± 6
Carbonate*	U	7.1 ± 0.9	4.2 ± 0.4
	L	8.5 ± 1.3	7.4 ± 1.0
Nitrate (as N)*	U	25.6 ± 2.5	16.2 ± 3.0
	L	24.1 ± 2.9	31.5 ± 6.1
Ammonium (as N)*†	U	3.0 ± 0.3	2.4 ± 0.2
	L	2.5 ± 0.2	2.0 ± 0.1
Phosphate (as P)	U	2.3 ± 0.2	2.7 ± 0.2
	L	1.7 ± 0.1	2.0 ± 0.1
Sulfate*	U	148 ± 19	20.2 ± 3.6
	L	155 ± 13	88.5 ± 16.3

Table 8-2. Chemical properties of soil samples collected at two depths at PVNGS agricultural and native monitoring sites, 1990 (means ± standard errors) (sheet 2 of 2)

Parameter	Depth	Agricultural soils (n = 78)	Native soils (n = 124)
Exchangeable ions (meq/100g)			
Calcium*†	U	23.5 ± 0.6	25.9 ± 0.7
	L	23.8 ± 0.6	25.7 ± 0.6
Magnesium*†	U	2.3 ± 0.1	1.9 ± 0.1
	L	2.2 ± 0.1	2.0 ± 0.1
Sodium*	U	2.8 ± 0.2	1.1 ± 0.2
	L	3.1 ± 0.2	2.7 ± 0.4
Potassium*†	U	1.3 ± 0.1	1.3 ± 0.1
	L	1.2 ± 0.1	1.3 ± 0.1

Key: U, upper-depth (0- to 15-centimeter) sample; L, lower-depth (15- to 30-centimeter) sample.

*For this parameter, means for upper- and lower-depth agricultural soil samples are not significantly different at 95-percent confidence level.

†For this parameter, means for upper- and lower-depth native soil samples are not significantly different at 95-percent confidence level.

Table 8-3. Chemical properties of soil samples collected at PVNGS agricultural monitoring sites, April, July, and November 1990 (means ± standard errors)

Parameter	April (end of wet season)	July (end of dry season)	November (postdefoliation)
Electrical conductivity (mmhos/cm)	1.33 ± 0.08[a]	1.35 ± 0.11[a]	1.39 ± 0.11[a]
pH (units)	8.66 ± 0.05[a]	8.71 ± 0.06[ab]	8.85 ± 0.06[b]
Soluble ions (ppm)			
Calcium	48.6 ± 5.7[a]	49.3 ± 6.0[a]	53.1 ± 6.2[a]
Magnesium	7.7 ± 1.2[a]	8.0 ± 0.9[a]	7.8 ± 0.9[a]
Sodium	264 ± 16[a]	252 ± 20[a]	234 ± 18[a]
Potassium	18.8 ± 2.8[a]	26.6 ± 2.9[a]	20.3 ± 2.8[a]
Chloride	173 ± 20[a]	181 ± 26[a]	186 ± 28[a]
Boron	2.1 ± 0.1[a]	2.2 ± 0.1[a]	2.2 ± 0.1[a]
Fluoride	5.2 ± 0.5[a]	5.6 ± 0.5[a]	5.0 ± 0.5[a]
Bicarbonate	280 ± 10[b]	268 ± 9[ab]	251 ± 11[a]
Carbonate	5.6 ± 1.1[a]	10.4 ± 1.6[b]	7.3 ± 1.4[ab]
Nitrate (as N)	21.7 ± 3.2[a]	23.7 ± 2.9[a]	29.1 ± 3.7[a]
Ammonium (as N)	1.7 ± 0.2	2.9 ± 0.3[a]	3.5 ± 0.3[a]
Phosphate (as P)	2.1 ± 0.2[ab]	1.6 ± 0.2[a]	2.2 ± 0.2[b]
Sulfate	157 ± 16[a]	146 ± 24[a]	151 ± 19[a]
Exchangeable ions (meq/100g)			
Calcium	25.4 ± 0.4[a]	27.0 ± 0.8[a]	18.6 ± 0.4
Magnesium	2.4 ± 0.1[a]	2.5 ± 0.1[a]	1.8 ± 0.1
Sodium	3.3 ± 0.2[b]	2.9 ± 0.2[ab]	2.7 ± 0.1[a]
Potassium	1.2 ± 0.1[a]	1.3 ± 0.1[a]	1.2 ± 0.1[a]

Key: For each parameter, means with same superscript are not significantly different at 95-percent confidence level.

Note: All values derived from analysis of 52 samples.

Table 8-4. Chemical properties of soils collected at PVNGS agricultural monitoring sites, 1990 (means ± standard errors) (sheet 1 of 2)

Parameter	Site 7 Fallow	Site 11 Fallow	Site 12 Fallow	Site 13 Cotton	Site 23 Cotton	Site 24 Fallow	Site 25 Fallow
Electrical conductivity (mmhos/cm)	0.71 ± 0.05^{a}	1.8 ± 0.13^{e}	2.84 ± 0.17^{f}	0.89 ± 0.05^{ab}	1.66 ± 0.28^{de}	0.96 ± 0.05^{ab}	1.72 ± 0.14^{e}
pH	8.85 ± 0.03^{f}	8.59 ± 0.04^{de}	8.33 ± 0.03^{b}	8.62 ± 0.05^{e}	8.44 ± 0.07^{bc}	8.68 ± 0.04^{e}	8.15 ± 0.04^{a}
Soluble ions (ppm)							
Calcium	28.0 ± 1.4^{ab}	43.4 ± 1.6^{bc}	112 ± 13^{e}	33.8 ± 1.6^{ab}	74.7 ± 16.2^{d}	35.3 ± 1.8^{ab}	138 ± 14^{f}
Magnesium	4.7 ± 0.3^{a}	4.7 ± 0.2^{a}	10.7 ± 1.2^{c}	5.2 ± 0.5^{a}	9.0 ± 2.2^{bc}	4.8 ± 0.3^{a}	25.8 ± 2.6^{e}
Sodium	133 ± 12^{a}	345 ± 28^{d}	467 ± 43^{e}	164 ± 10^{ab}	329 ± 49^{d}	173 ± 14^{ab}	155 ± 14^{a}
Potassium	11.8 ± 1.7^{ab}	31.7 ± 1.4^{e}	79.0 ± 2.8^{f}	20.8 ± 2.8^{cd}	12.8 ± 2.1^{ab}	27.2 ± 3.1^{de}	32.3 ± 2.8^{e}
Chloride	46.7 ± 9.1^{a}	269 ± 27^{d}	593 ± 53^{e}	98.7 ± 10.7^{ab}	275 ± 69^{d}	86.5 ± 10.7^{ab}	139 ± 19^{b}
Boron	1.8 ± 0.1^{cd}	3.0 ± 0.2^{f}	2.9 ± 0.2^{f}	1.1 ± 0.1^{a}	1.7 ± 0.1^{cd}	1.6 ± 0.1^{abc}	1.1 ± 0.1^{ab}
Fluoride	2.1 ± 0.4^{ab}	12.1 ± 0.4^{h}	4.5 ± 0.3^{cd}	7.2 ± 0.7^{ef}	6.5 ± 0.5^{ef}	3.2 ± 0.2^{bc}	1.5 ± 0.1^{a}
Bicarbonate	252 ± 9^{cd}	274 ± 10^{def}	162 ± 9^{a}	282 ± 10^{def}	299 ± 26^{ef}	215 ± 6^{bc}	183 ± 19^{ab}
Carbonate	3.6 ± 0.8^{ab}	5.2 ± 1.5^{ab}	2.4 ± 0.0^{a}	4.3 ± 0.9^{ab}	2.9 ± 0.3^{a}	5.0 ± 1.1^{ab}	2.4 ± 0.0^{a}
Nitrate (as N)	20.8 ± 4.0^{c}	20.3 ± 3.3^{bc}	84.4 ± 6.2^{f}	5.6 ± 1.0^{a}	18.2 ± 5.8^{bc}	36.9 ± 2.9^{d}	48.4 ± 5.9^{e}
Ammonium (as N)	2.4 ± 0.5^{abc}	2.0 ± 0.2^{ab}	3.6 ± 0.8^{c}	2.3 ± 0.5^{abc}	3.4 ± 0.6^{bc}	1.2 ± 0.0^{a}	3.4 ± 0.6^{bc}
Phosphate (as P)	3.4 ± 0.3^{c}	1.1 ± 0.1^{a}	3.3 ± 0.2^{c}	1.8 ± 0.1^{b}	2.2 ± 0.3^{b}	1.9 ± 0.1^{b}	1.7 ± 0.2^{b}
Sulfate	34.1 ± 8.2^{a}	209 ± 13de	211 ± 22de	53.3 ± 8.6^{ab}	217 ± 40^{e}	46.8 ± 8.6^{ab}	373 ± 69^{f}
Exchangeable ions (meq/100g)							
Calcium	22.2 ± 0.6^{bc}	26.8 ± 1.3^{def}	22.5 ± 0.9^{bc}	22.8 ± 1.1^{bc}	26.7 ± 1.6^{def}	23.2 ± 0.7^{bcd}	27.1 ± 1.3^{ef}
Magnesium	3.2 ± 0.1^{f}	2.2 ± 0.1^{de}	1.5 ± 0.1^{b}	1.9 ± 0.1^{cd}	2.3 ± 0.1^{e}	2.0 ± 0.1^{cd}	3.8 ± 0.2^{g}
Sodium	1.5 ± 0.2^{a}	4.3 ± 0.3^{de}	3.5 ± 0.3^{d}	1.9 ± 0.1^{ab}	4.1 ± 0.5^{de}	1.9 ± 0.1^{abc}	1.6 ± 0.1^{a}
Potassium	0.7 ± 0.0^{b}	2.4 ± 0.1^{g}	2.4 ± 0.1^{g}	1.3 ± 0.0^{d}	1.1 ± 0.0^{d}	1.8 ± 0.1^{f}	1.6 ± 0.1^{e}

Table 8-4. Chemical properties of soils collected at PVNGS agricultural monitoring sites, 1990 (means ± standard errors) (sheet 2 of 2)

Parameter	Site 28 Fallow	Site 30 Fallow	Site 31 Fallow	Site 32 Fallow	Site 43 Alfalfa	Site 45 Fallow
Electrical conductivity (mmhos/cm)	0.63 ± 0.04[a]	1.52 ± 0.10[de]	1.35 ± 0.09[cd]	1.09 ± 0.12[bc]	1.63 ± 0.12[de]	0.93 ± 0.06[ab]
pH	8.95 ± 0.04[f]	8.54 ± 0.03[cde]	9.28 ± 0.07[g]	9.36 ± 0.07[g]	8.46 ± 0.05[bcd]	9.38 ± 0.05[g]
Soluble ions (ppm)						
Calcium	24.9 ± 1.0[ab]	40.8 ± 2.2[bc]	26.3 ± 1.1[ab]	21.0 ± 1.0[a]	58.3 ± 3.3[cd]	18.9 ± 1.1[a]
Magnesium	3.1 ± 0.3[a]	6.3 ± 0.5[ab]	4.3 ± 0.8[a]	4.6 ± 1.1[a]	14.4 ± 1.0[d]	4.3 ± 0.8[a]
Sodium	136 ± 12[a]	297 ± 25[cd]	285 ± 24[cd]	252 ± 26[c]	288 ± 24[cd]	232 ± 16[bc]
Potassium	9.8 ± 1.4[a]	10.8 ± 1.1[ab]	9.7 ± 1.5[a]	17.8 ± 6.7[bc]	13.3 ± 0.8[abc]	7.5 ± 1.6[a]
Chloride	39.8 ± 8.6[a]	235 ± 24[cd]	158 ± 22[bc]	103 ± 20[ab]	254 ± 32[d]	42.1 ± 8.6[a]
Boron	1.6 ± 0.1[bc]	2.0 ± 0.1[cd]	3.6 ± 0.2[g]	2.7 ± 0.3[ef]	2.2 ± 0.2[de]	2.6 ± 0.2[ef]
Fluoride	1.7 ± 0.2[a]	5.8 ± 0.3[de]	7.3 ± 1.1[f]	8.8 ± 0.8[g]	1.9 ± 0.1[ab]	5.8 ± 0.7[def]
Bicarbonate	262 ± 14[de]	251 ± 5[cd]	291 ± 12[def]	303 ± 17[f]	306 ± 17[f]	383 ± 14[g]
Carbonate	7.9 ± 1.4[bc]	3.6 ± 0.6[ab]	12.1 ± 1.5[cd]	13.8 ± 4.5[d]	4.0 ± 1.0[ab]	33.9 ± 2.7[e]
Nitrate (as N)	10.1 ± 1.6[ab]	13.3 ± 1.4[abc]	21.9 ± 2.7[c]	14.2 ± 3.5[abc]	15.0 ± 3.2[abc]	14.0 ± 1.3[abc]
Ammonium (as N)	3.4 ± 1.0[bc]	2.7 ± 0.7[abc]	1.6 ± 0.2[a]	1.5 ± 0.2[a]	5.9 ± 0.8[d]	2.0 ± 0.5[abc]
Phosphate (as P)	1.1 ± 0.1[a]	0.8 ± 0.1[a]	1.7 ± 0.2[b]	1.0 ± 0.1[a]	4.7 ± 0.4[d]	1.0 ± 0.1[a]
Sulfate	44.8 ± 15.1[ab]	234 ± 26[e]	136 ± 27[cd]	114 ± 23[bc]	264 ± 32[e]	31.3 ± 13.3[a]
Exchangeable ions (meq/100g)						
Calcium	29.9 ± 1.7[f]	25.6 ± 1.7[cde]	17.9 ± 1.0[a]	18.2 ± 1.0[a]	20.6 ± 1.4[ab]	24.3 ± 1.9[cde]
Magnesium	1.8 ± 0.0[bc]	2.9 ± 0.2[f]	0.9 ± 0.1[a]	0.9 ± 0.1[a]	3.7 ± 0.2[g]	2.1 ± 0.2[cde]
Sodium	2.5 ± 0.3[bc]	4.4 ± 0.4[ef]	2.6 ± 0.1[c]	2.4 ± 0.2[bc]	2.6 ± 0.2[c]	5.1 ± 0.4[f]
Potassium	1.1 ± 0.0[d]	1.1 ± 0.0[d]	0.6 ± 0.0[b]	0.3 ± 0.0[a]	0.8 ± 0.0[c]	0.7 ± 0.0[bc]

Key: For each parameter, means with same superscript letter are not significantly different at 95-percent confidence level. Alphabetic sequence of superscripts corresponds to increase in concentration level; thus letter a represents lowest level and letters b through i successively higher levels.

Note: All values derived from analysis of 12 samples.

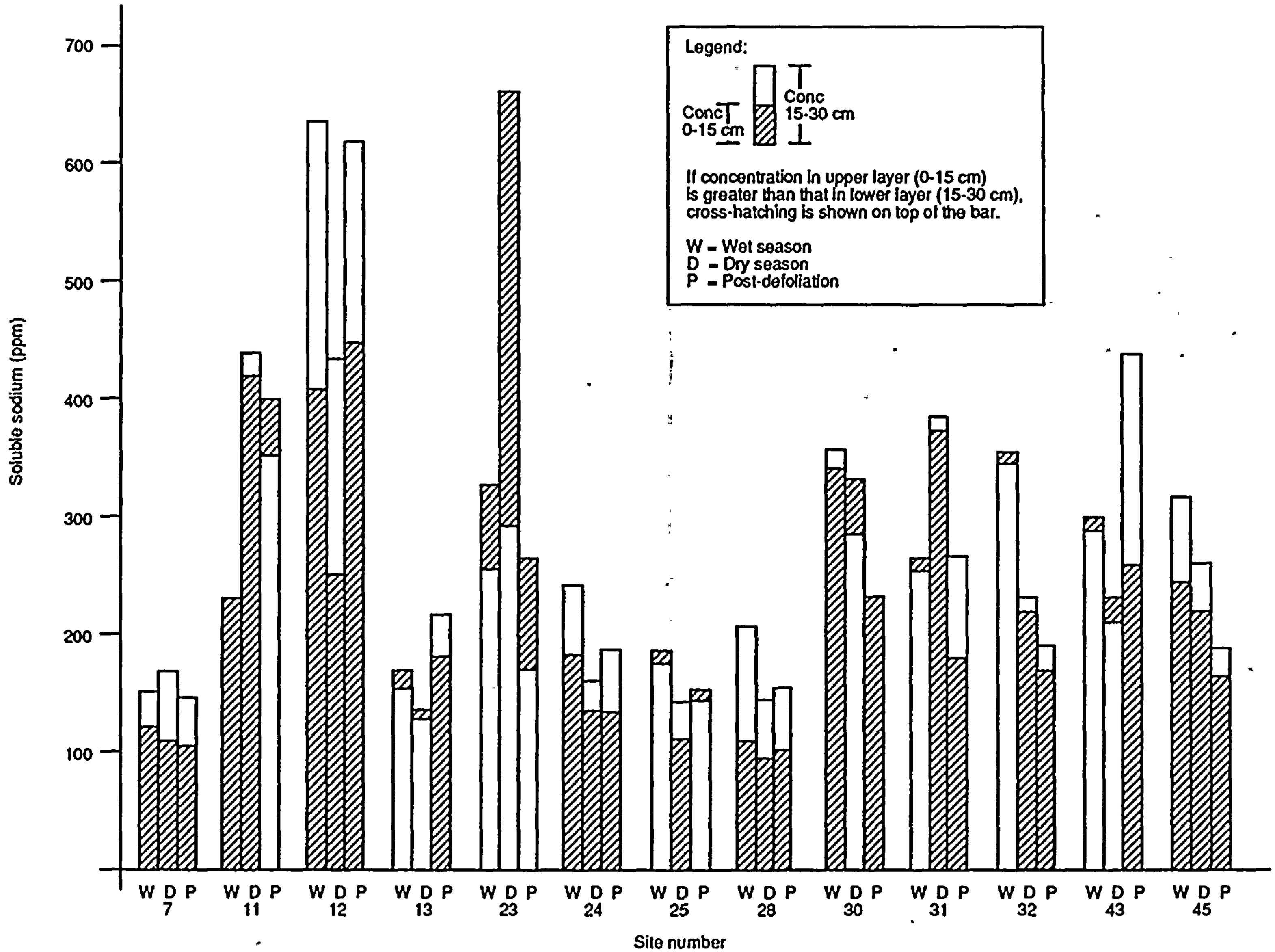

Figure 8-1. Mean concentrations of soluble sodium in soils at PVNGS agricultural monitoring sites by depth and season, 1990

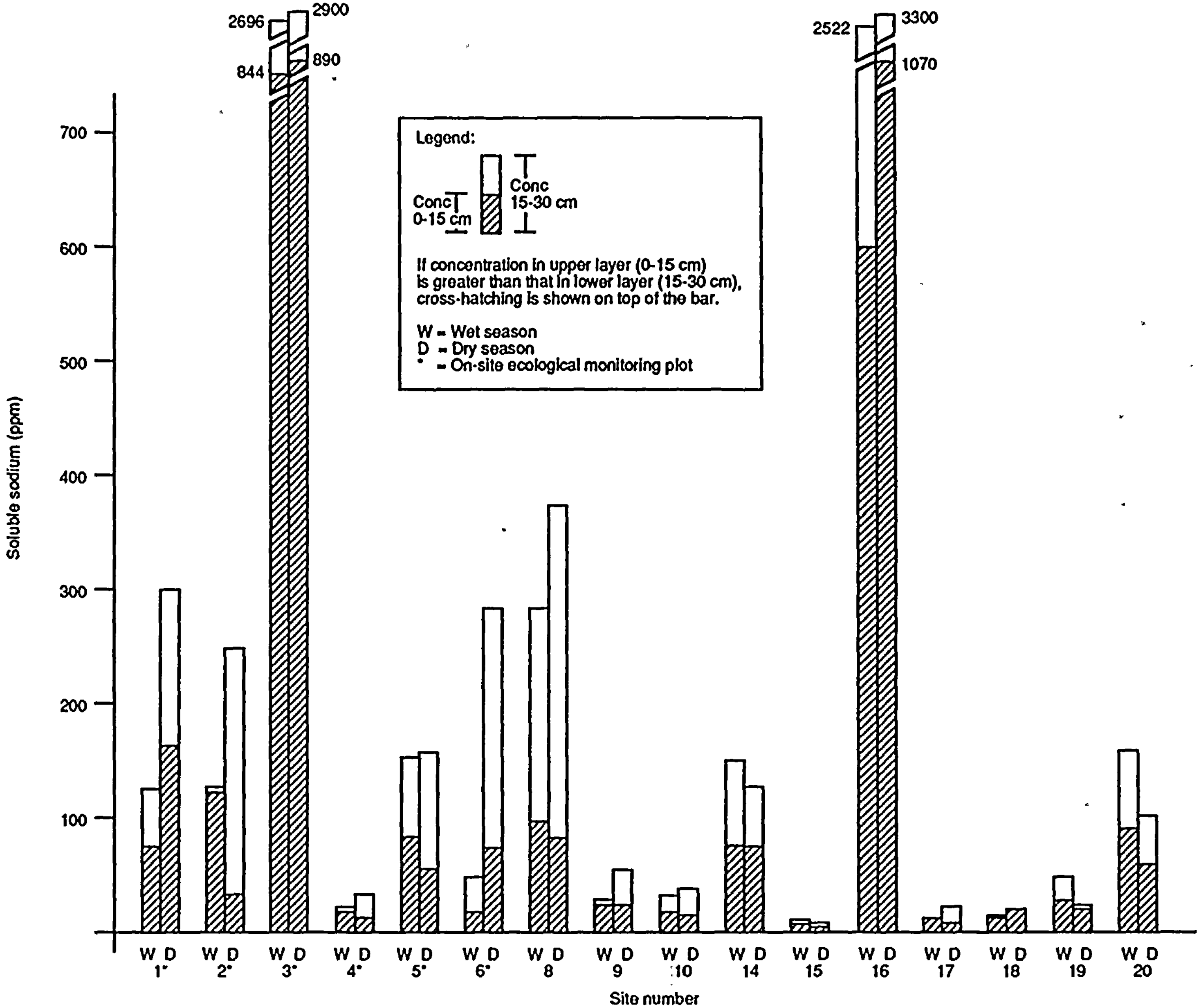

Figure 8-2. Mean concentrations of soluble sodium in soils at PVNGS native monitoring sites by depth and season, 1990 (sheet 1 of 2)

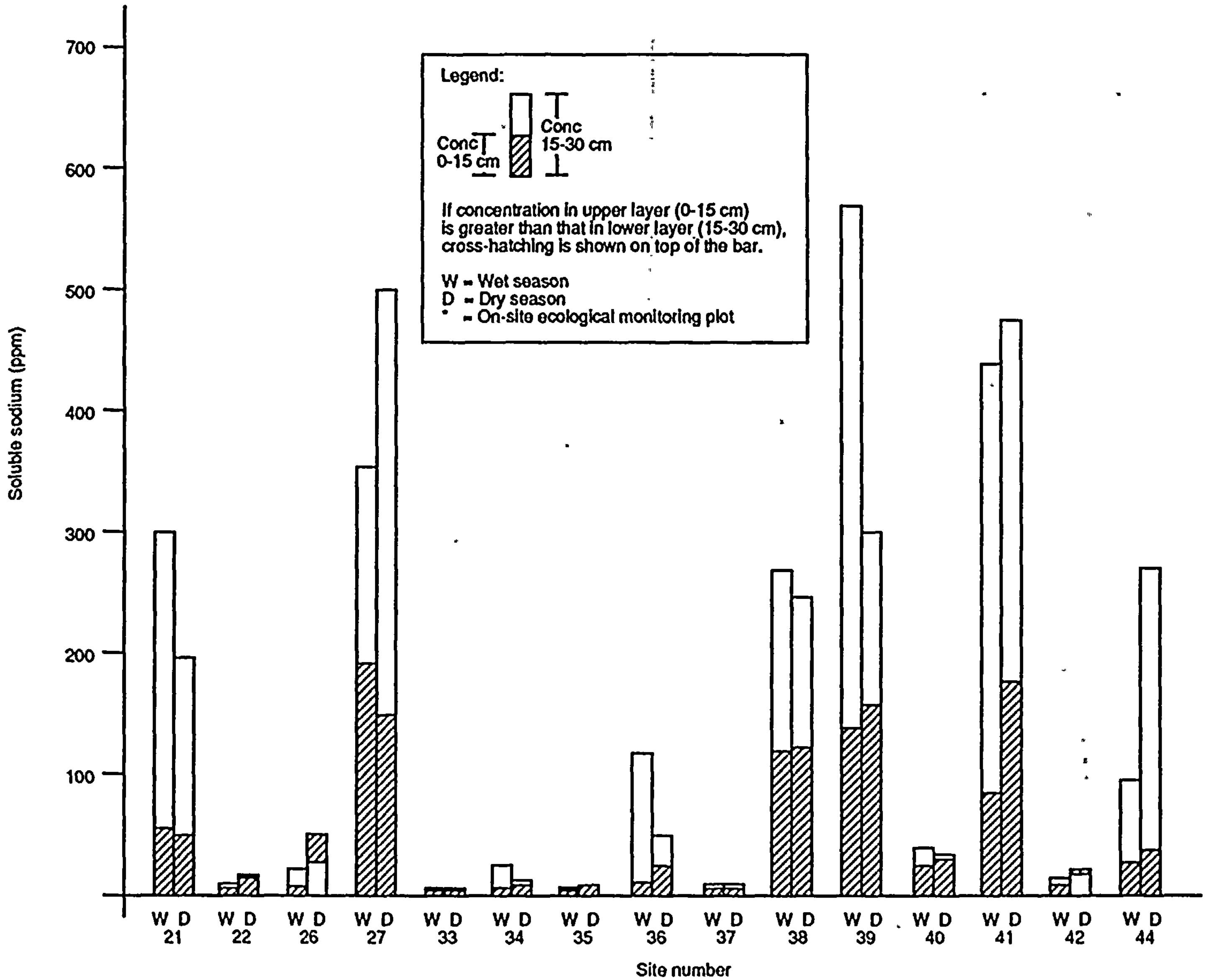

Figure 8-2. Mean concentrations of soluble sodium in soils at PVNGS native monitoring sites by depth and season, 1990 (sheet 2 of 2)

9 Discussion of Comparisons of Parameters

9.1 METEOROLOGY

9.1.1 General Meteorology and Climatological Comparisons

Monthly averages of temperature, dew point, and wind speed and monthly totals of precipitation at PVNGS for 1990 and for the period 1974-1985 are presented in Table 9-1. National Weather Service Phoenix (NWS) climatological data for 1990 and the period 1950-1980 are presented in Table 9-2. As shown in these data, the precipitation at PVNGS for 1990 was slightly lower than the annual average for the period 1974-1985. The average wind speed at PVNGS for 1990 was slightly higher than the 1974-1985 annual average. The late winter and spring months had average wind speeds generally higher than the 1974-1985 averages. The annual average temperature for 1990 at PVNGS was the same as the long-term average. The precipitation at NWS for 1990 was greater than the annual average for 1950-1980. The average wind speed for 1990 at NWS was slightly lower than the annual average recorded for 1950-1980. The average 1990 temperature for NWS was considerably higher than the NWS long-term average.

A comparison of the data presented in Tables 9-1 and 9-2 shows that, in terms of 1990 annual averages, the temperature and dew point for PVNGS were 4°F and 5°F, respectively, lower than those for NWS. The precipitation for PVNGS was lower than the NWS precipitation collected during 1990. The PVNGS wind speeds were higher than the wind speeds at NWS during 1990.

9.1.2 Effects of Meteorological Parameters on Dustfall, Soils, and Vegetation

Meteorological conditions for the site area influence the atmospheric particulate levels, soil conditions, runoff, and vegetative growth. These impacts may be locally altered by irrigation activities.

Locally heavy thunderstorms or other severe weather can at times damage one or more sites in the monitoring area. Which sites are affected is dependent upon the size, strength, path, and duration of any particular storm.

9.2 DRIFT DEPOSITION

Monthly deposition of drift constituents calculated from samples collected during the preoperational period (1983-1985) and 1990 were analyzed to determine whether differences exist between the two sets.

In view of the absence of changes in data from 1984 to 1985 related to the limited operation of PVNGS in 1985, the preoperational data set has been defined to include

1. Valid 1983 and 1984 data from all monitoring sites

2. Valid 1985 data from all offsite monitoring sites

3. 1985 data from those onsite locations at which measured deposition for operating months exceeded 10 times the predicted deposition for those periods (this excludes sites 14, 16, 20, 80, 81, and 83)

Therefore, the preoperational period for drift deposition at all agricultural sites is May 1983 through December 1985. The preoperational period for all native sites is also May 1983 through December 1985 with the following exceptions. According to results of a previous analysis (NUS, 1987a), the preoperational period for sites 16 and 20 is defined as May 1983 through December 1984. For sites 80, 81, and 83, which did not begin operation until May 1985, no meaningful preoperational period can be defined, as there were only 4 months without significant drift from the PVNGS Unit 1 cooling towers. Site 82 also began operation in May 1985, and the 8 months of data available are insufficient for an adequate assessment of preoperational drift deposition. Thus, the preoperational data set for sites 80-83 is defined as the mean for the onsite locations (i.e., sites 1-6, 10, 14, 16, 20, and 27) for 1983-1985 excluding sites 14, 16, and 20 in 1985 and including site 82 in 1985.

The preoperational values for all ions and total suspended solids (TSS) were recalculated in 1987 using the method described in Chapter 5. This method includes, in the calculation of means and standard errors, values of one-half the detection limit for those samples of ions and TSS whose concentrations were below the detection limit. For the onsite locations, the preoperational

period for 1985 was reevaluated to determine if the criteria defined above were valid. The results suggest that site 14 data should have been excluded from the 1985 calculations. However, the impact of excluding these data was calculated and found to be insignificant. As a result, the 1985 values presented herein include site 14 data.

The two data sets (i.e., preoperational and 1990) were compared statistically to determine whether any differences were significant at the 95-percent confidence level. Comparisons were made for those major ionic constituents present in the cooling tower basin water whose deposition was not below the laboratory detection limit more than 25 percent of the time. These selected ions constitute the most significant portion of the salt drift from the cooling towers. As evidenced by the annual reports for 1984 through 1989, as well as the data presented in Chapter 5 of this report, ionic deposition varies greatly by site and by month for any particular year. Accordingly, comparisons are provided for nearly homogeneous site groups (both agricultural and native [nonagricultural] sites) as well as by month. In addition, comparisons are made for agricultural and native control sites for the two data sets.

9.2.1 Drift Deposition Comparisons and Methods

Monthly deposition values were analyzed to determine the differences in deposition rate between the preoperational period and 1990. The data for each constituent were examined individually by monitoring site and by month. Many of the monthly samples produced concentrations at or below the detection limit more than 25 percent of the time. Of the 14 parameters measured in each sample, only sodium, potassium, calcium, magnesium, and TSS were not routinely below their analytical detection limits. Therefore, only these constituents were compared in the deposition analyses. Other ions were not included in any subsequent analyses.

The monitoring sites were divided into four groups: agricultural sites; native sites; supplemental sites, which are near the cooling towers; and native sites at various distances from PVNGS. For comparison, deposition measured at the four control sites (two native and two agricultural sites) were also examined. The statistical significance of differences in the

monthly means of each constituent between the preoperational and 1990 data sets was determined using the two sample t-tests. Depending on the differences in the variances between the two means, the calculation of the t-statistic assumed either the pooled-variance t-test or the separate-variance t-test. The pooled-variance t-test was used when the variances of the data sets were statistically equal at the 95-percent confidence level. The separate-variance estimate was used when the two variances were unequal statistically at the 95-percent confidence level.

9.2.2 Drift Deposition at Agricultural Sites

Table 9-3 presents the annual deposition of the four measurable ions and TSS for all agricultural sites (sites 7, 11-13, 23-25, 28, 30-32, 43, and 45) for the preoperational and 1990 data sets. As the table indicates, the increases in the mean annual deposition of calcium, magnesium, and TSS between the preoperational period and 1990 were statistically significant; potassium had lower deposition in 1990 than in the preoperational period. There was no statistically significant change in the mean annual deposition of sodium.

Figures 9-1 through 9-3 show the mean monthly deposition for the preoperational and 1990 data sets for the combined agricultural sites. These figures reflect the large variability in measured deposition rates both month-to-month and within any month for both data sets, and apparent peaks in 1990 (except for sodium and calcium) are not significant.

Table 9-4 presents the annual deposition for sodium, potassium, and calcium for each agricultural site for the preoperational period and 1990. Although chloride and sulfate were both prominent ions in the cooling tower basin water, deposition rates were not calculated because 50 and 91 percent, respectively, of the deposition samples were below their detection limits. Also included in the table is an indication of those sites and analytes for which statistically significant changes occurred between the two data periods.

Most of the changes in ionic deposition in 1990 that were statistically significant at some of the agricultural sites were decreases from the respective preoperational means. Only the deposition of sodium and potassium

at site 23 and that of calcium at sites 13, 23, and 32 showed significant increases between the preoperational period and 1990. Decreases in the deposition of sodium were statistically significant at sites 12, 25, and 45. Decreases in potassium deposition were statistically significant at all agricultural sites except 12, 13, 23, 30, and 32. The deposition of calcium at site 25 was significantly lower in 1990 than in the preoperational period.

9.2.3 Drift Deposition at Native Sites

Table 9-5 presents the annual deposition of the four measurable ions and TSS at the combined native sites (sites 1-6, 8-10, 14-22, 26, 27, 33-42, 44, and 80-83) for the preoperational period and 1990. The mean annual deposition of potassium showed a statistically significant decrease between the preoperational period and 1990. The mean annual deposition for sodium, calcium, magnesium, and TSS showed statistically significant increases.

Tables 9-6 through 9-9 present annual deposition of the four measurable ions and TSS for native sites at various distances from PVNGS for the preoperational period and 1990. Table 9-6 presents data for the four supplemental sites (sites 80-83) nearest the cooling towers; Table 9-7 provides data for the other native sites (sites 3, 14, 16, and 20) within 1 mile of PVNGS (centered on the centroid of the Unit 2 cooling towers); and Tables 9-8 and 9-9 reflect the analyses for those native sites from 1 to 2 miles (sites 1, 2, 5, 6, 9 and 10) and more than 2 miles (sites 4, 8, 9, 15, 17, 18, 19, 21, 22, 26, 27, 33-42, and 44) from PVNGS, respectively.

Changes in sodium deposition rates from preoperational values were statistically significant at all distances except between 1 and 2 miles, with increases in 1990 at all the native sites out to 1 mile and with decreases at those more than 2 miles away. The mean annual sodium deposition and the magnitudes of the differences between preoperational and 1990 values decreased with increasing distance from PVNGS. Potassium showed significant decreases at all distances between the preoperational period and 1990 except at the supplemental sites, where the decrease was not statistically significant. Calcium significantly increased at the supplemental sites, showed no significant change for other sites out to 1 mile and sites beyond 2 miles, and showed a significant increase at those sites between 1 and 2 miles

away. Magnesium showed a significant increase at sites out to 2 miles away and no significant change for sites beyond 2 miles. Total suspended solids showed a statistically significant increase at all native sites out to 2 miles and no significant change beyond 2 miles between the preoperational period and 1990.

Figures 9-4 through 9-6 show the mean monthly deposition for the preoperational period and for 1990 at all native sites. As with the agricultural sites, a large variability in deposition rates exists both within months and from month-to-month for both periods for most ions, which makes apparent peaks not statistically significant (except for peaks for calcium in July 1980 and sodium in September and December 1990).

Table 9-10 presents annual deposition for sodium, potassium, and calcium for each native site for the preoperational period and 1990. The table identifies individual sites and analytes that showed statistically significant changes in annual mean values between the preoperational period and 1990.

Annual sodium deposition significantly increased at site 20, which is on the site, and at the supplemental sites (80-83). Examination of the monthly data for the onsite monitoring locations (Appendix C) indicates that the largest differences from the preoperational period occurred in August and December. Decreases in the sodium deposition rate were significant at sites 15, 17, 22, 34-36, and 38-42. Annual calcium deposition significantly increased at sites 4, 6, 9, 15, 19, and 44, and at the supplemental sites (80-83). The largest differences occurred in July and September. There was a significant decrease in the calcium deposition rate at site 17. Annual potassium deposition decreased significantly at sites 8, 14, 17, 21, 22, 27, 33-36, 38, 39, 41, 82, and 83 in 1990. There was a significant increase in potassium deposition at site 19.

9.2.4 Drift Deposition at Agricultural and Native Control Sites

The salt deposition monitoring network includes two sets of neighboring agricultural and native control sites. The purpose of the control sites is to measure natural levels and distribution of salt deposition at distances

unlikely to be affected by PVNGS cooling tower emissions. These paired monitoring locations are sites 25 and 40, located approximately 20 miles northwest of PVNGS, and sites 42 and 43 some 15 miles southeast; sites 25 and 43 are the agricultural sites.

Table 9-11 presents the annual drift deposition for both the agricultural and native paired control sites for the preoperational period and 1990.

For the agricultural site pair, potassium, calcium, magnesium, and TSS significantly decreased between the preoperational period and 1990. For the native site pair, sodium significantly decreased and magnesium and TSS significantly increased.

9.2.5 Deposition Measurement and Prediction

Table 9-12 provides estimated net sodium deposition in 1990 at each of the 15 onsite drift deposition monitoring locations (sites 1-6, 10, 14, 16, 20, 27, and 80-83), as corrected for the preoperational period deposition. Since TDS was not measured in the drift deposition samples, the TDS values for 1990 were estimated from measured sodium deposition rates, assuming that the average TDS-to-sodium ratio in the circulating water at Units 1, 2, and 3 of 3.3 ± 0.09 (Appendix B) was applicable. The last column in the table provides the estimated net TDS deposition for each onsite location in 1990.

Assuming that the preoperational values are representative of 1990 absent any plant effects, any positive changes should be from other sources, including the PVNGS cooling towers. It is clear from these data that during 1990 the sites with the largest net deposition were those closest to the cooling towers (sites 3, 20, and 80-83). As in 1988 and 1989, it appears that the preoperational sodium value may overestimate the current "background" value.

Table 9-13 presents a comparison of the measured net deposition values and FOG-code-predicted deposition (Table 4-3) at each onsite location for 1990. For seven of these locations the net deposition was not significantly different from zero; the values are listed for purposes of qualitative comparison with predictions, but are not used in subsequent quantitative comparisons.

In general, there is not good agreement between the net measured and predicted deposition values for 1990 (Figure 9-7); the correlation coefficient (R^2) of 0.29 for the 1990 data shows a much poorer correlation than the value (0.86) for the corresponding 1989 data set. To a considerable extent, the reduced correlation is influenced by the application of the NUS FOG model at the very close distances to the towers where other influences (micro wind field effects and WRF emissions) are effective. Thus, excluding sites 16, 81, and 82 from the data set raises the correlation coefficient to 0.82 as shown in Figure 9-8.

9.2.6 Deposition Summary and Conclusions

From analyses of the drift deposition in 1990, the following conclusions can be drawn:

1. There was a statistically significant increase in sodium, calcium, magnesium, and TSS deposition between the preoperational period and 1990 at the native sites within about 1 mile of PVNGS (sites 80-83 and sites 3, 14, 16, and 20).

2. At native sites more than about 1 mile from PVNGS, the average deposition rates of calcium, magnesium, and TSS showed significant increases from those of the preoperational period. However, sodium and potassium deposition at sites in this group either showed a significant decrease or were unchanged.

3. Calcium, magnesium, and TSS annual mean deposition showed a statistically significant increase between the preoperational period and 1990 at the agricultural sites. Potassium annual mean deposition rates showed a significant decrease. Sodium annual mean deposition did not show a significant change. No effects of the operation of the cooling towers on measured deposition were evident except possibly at site 23 southwest of the cooling towers.

4. A poor correlation was obtained between NUS FOG-code-predicted deposition and measured deposition in 1990.

5. Low-volume air sampler data were again of no value for detecting and identifying the drift patterns.

9.3 AGRICULTURAL CROPS AND NATIVE VEGETATION

The variability of ionic concentrations of leaf phytomass and leaf surface rinsate and the structural characteristics of native plant communities have been discussed in previous reports (NUS, 1985; 1986a,b; 1987a,b; 1988a; 1989; 1990). The following sections compare the results of chemical and structural analyses for 1990 with pooled data for the period 1983 through 1985 (i.e., the preoperational period).

9.3.1 Agricultural Crops

A total of 13 agricultural monitoring sites were identified at the beginning of the monitoring program in 1983. These sites were selected because they were representative of local agricultural practices and were in the general vicinity of PVNGS. Variations in crop sequence since 1983 are presented in Table 9-14. Monitoring site 29 was discontinued after the 1983 growing season because of vandalism; it was replaced by monitoring site 45 beginning in 1984. During the monitoring period, cotton was the most consistently planted crop in the vicinity of PVNGS, with the short-staple variety being planted over three times more frequently in the monitored fields than the long-staple variety. In 1990, short-staple cotton was planted at sites 11, 13, 23, and 30; long-staple cotton was not planted at any monitoring site in 1990.

Alfalfa has been the second most frequently planted crop in the vicinity of PVNGS. This legume generally remains in production for 4 to 5 years and may be harvested up to four times per year. Monitoring site 43 has been planted in alfalfa since 1983. Other crops that have been planted at monitored fields include barley, sorghum, and melon (Table 9-14).

9.3.1.1 Alfalfa

Because of crop rotations (Table 9-14), the comparison of ionic concentrations of alfalfa leaf tissue for the preoperational period and 1990 was limited to monitoring site 43 (Table 9-15). With the exception of

calcium and phosphate, there were no significant differences between the mean ionic concentrations in alfalfa leaf tissue for the preoperational period and 1990 at that site. The mean concentrations of calcium and phosphate were significantly higher in 1990 than in the preoperational period. Because site 43, a control, lies well beyond the range of predicted drift deposition from PVNGS, the increase in ionic concentration for calcium and phosphate in 1990 is unrelated to the operation of PVNGS.

9.3.1.2 Cotton

The preoperational and 1990 ionic content of short-staple cotton leaf phytomass was evaluated at four monitoring sites (Table 9-16). Sodium levels at sites 11 and 23 were significantly higher in 1990 than during the preoperational period, while the opposite was true at site 30. There was no significant difference between the sodium levels at site 13 for the two monitoring periods. Potassium concentrations were significantly higher in 1990 than during the preoperational period at sites 11 and 30; sites 13 and 23 showed no significant difference in potassium levels. Concentrations of calcium were significantly higher in 1990 than during the preoperational monitoring period at each of the four sites. Magnesium levels were significantly higher in 1990 than during the preoperational monitoring period at sites 11, 23, and 30, while those at site 13 for the two periods were not significantly different. Levels of chloride were significantly higher in 1990 than during the 1983-1985 period at sites 11 and 13. At site 23, chloride values showed no significant difference, and at site 30, the 1990 value was significantly lower than the preoperational level. Concentrations of sulfate were significantly higher in 1990 than during the preoperational period at sites 11 and 13; however, there was no significant difference in values at site 23 or 30. In 1990, nitrate levels were found to be significantly lower than during the preoperational period for all sites. In the case of phosphate, concentrations were significantly higher at sites 13 and 30 in 1990 than during the 1983-1985 period. There was no significant difference in phosphate values at sites 11 and 23. Fluoride concentrations were significantly lower in 1990 than during the preoperational period at site 30; all other sites showed no significant difference.

9.3.1.3 Cotton Yield

A comparison of the mean cotton yield for the period 1983-1990 at agricultural monitoring sites in the vicinity of PVNGS is presented in Table 9-17. A comparison of 1990 yields with preoperational (i.e., 1983-1985) data is possible for sites 11, 13, 23, and 30. Sites 11 and 13 have been planted in short-staple cotton since 1983 and 1984, respectively. Sites 23 and 30 have been planted in a variety of crops since the study began in 1983, including melons, alfalfa, barley, long-staple cotton, and short-staple cotton.

The mean cotton yield for site 11 in 1990 was not significantly different from that for 1983. At site 13 the 1990 cotton yield was found to be significantly lower than that reported for 1984. Yield estimates are available for all three preoperational years for site 23. The yield for 1990 was significantly higher than that for 1983 through 1985. Cotton yield at site 30 was not significantly different in 1990 from that reported in 1985.

The grand mean cotton yields at sites 11, 13, 23, and 30 were higher for the operational period (2821, 3667, 3666, and 2482 pounds per acre, respectively) than they were for the preoperational period (2514, 3201, 1911, and 2470 pounds per acre, respectively). It is noteworthy, however, that for site 30 the difference is slight.

Final statistics for 1990 cotton yields in Arizona were unavailable at the time this report was written. However, the cotton harvest forecast provides estimates of average statewide yield of 1131 pounds per acre for short-staple cotton and 755 pounds per acre for long-staple cotton (Kenerson, 1991). This represents a decrease in yield for both varieties relative to the 1989 yields. These values represent 81 and 74 percent, respectively, of the 1987 record harvest for short-staple and long-staple cotton. Historically, estimates of yield from NUS field studies have been higher than those compiled by the U.S. Department of Agriculture, Arizona Agricultural Statistics Service, because the removal of cotton lint by hand is a more complete process than mechanical harvesting.

9.3.2 Native Vegetation

Native vegetation was monitored at eight locations on or near PVNGS. Sites 1, 4, 6, 40, and 42 are creosote bush communities, while sites 2, 3, and 44 are salt bush communities. Sites 40, 42, and 44 are controls which are located sufficiently far from the PVNGS so as not to be influenced by cooling tower drift.

9.3.2.1 Creosote Bush

The preoperational and 1990 ionic content of creosote bush leaf tissue was evaluated at five monitoring sites (Table 9-18). The mean concentrations of sodium and magnesium showed no significant change at any site between the preoperational period and 1990. Levels of potassium and phosphate were significantly higher in 1990 than in 1983-1985 at sites 1, 4, 6, and 40; there was no significant difference at site 42. Calcium levels were significantly higher at sites 4 and 6 in 1990 than during the preoperational period. Calcium values for sites 1, 40, and 42 did not change significantly between the monitoring periods. While chloride concentrations at site 40 showed no significant change between the preoperational and operational periods, those at each of the remaining sites were significantly higher in 1990 than in 1983-1985. The mean concentrations of sulfate and nitrate were significantly lower in 1990 than in the preoperational period at all sites. Values for fluoride were significantly higher in 1990 than in 1983-1985 at sites 6 and 40, while there was no significant difference between the values for the two monitoring periods at sites 1, 4, and 42.

An analysis of the phytosociological structure of the five creosote bush communities for the preoperational and operational periods is presented in Table 9-19. Generally, the perennial shrub stratum was monotypic, with creosote bush being the dominant shrub at each site. The operational cover values for creosote bush presented in Table 9-19 are lower than those presented in the 1989 Annual Report (NUS, 1990). Further, coverage values for the operational period are lower than those for the preoperational period for all sites except site 42. As noted in the 1989 Annual Report, this downward trend is due, at least in part, to the continued sampling of leaf tissue (for ion analysis), which stresses plants and reduces cover. As in

the past, the cover values for creosote bush break down into two groups: higher for sites 1, 6, and 42 and lower for sites 4 and 40.

Fifty-seven species of herbaceous flora have been tabulated since studies were initiated. Based on percent cover, dominant species within the study plots include Amsinckia intermedia, Erodium texanum, Euphorbia spp., Lepidium lasiocarpum, Plantago insularis, and Sphaeralcea Coulteri. Of the nine species of grass that were identified, Festuca octoflora and Schismus spp. were seen most often within the study plots. Five species of cacti were enumerated; most belonged to the genus Opuntia.

Between 1.4 and 2.1 times as many species were recorded during the operational monitoring period than during the preoperational period. This observation is not surprising, given the different lengths of the two periods: 5 years for the operational period versus 3 years for the preoperational period. Onsite monitoring locations (sites 1, 4, and 6) had markedly higher species richness than control sites 40 and 42. Heterogeneity was similar between operational and preoperational periods at sites 1, 4, and 42, but it was higher in 1986-1990 at monitoring sites 6 and 40. A comparison of similarity indices for the preoperational and operational periods indicates that of the onsite monitoring locations, site 4 had the highest similarity. As for the offsite control locations, site 42 had the highest similarity index.

9.3.2.2 Salt Bush

The preoperational and 1990 ionic content of salt bush leaf tissue is presented in Table 9-20. The mean concentration of sodium was significantly higher at all salt bush sites in 1990 than during the preoperational period. Potassium levels were significantly higher at sites 2 and 3 in 1990 than in 1983-1985; at site 44 there was no significant difference. Levels of calcium, chloride, and nitrate for the two periods showed no significant differences at any location. Values for magnesium were not significantly different at sites 3 and 44; however, magnesium levels were significantly higher at site 2 in 1990 than during the preoperational period. Mean concentrations of sulfate were significantly lower in 1990 than in 1983-1985 at all sites. Phosphate values at sites 2 and 44 were not significantly

different from those of the preoperational monitoring period, but the values at site 3 were significantly higher in 1990. Levels of fluoride at sites 2 and 44 were significantly higher in 1990 than during the preoperational monitoring period; those at site 3 for the two periods were not significantly different.

Salt bush (Atriplex polycarpa) was the dominant species at each site during both the preoperational and operational monitoring periods (Table 9-21). Percent cover for the operational period was lower at site 44, equal at site 2, and higher at site 3 than that of the preoperational period. Coverage in 1990 was higher at sites 2 and 44 than in 1989 (NUS, 1990), thus reversing the downward trend observed since 1987. Coverage at site 3 was once again lower in 1990. The adverse effect on coverage of removing leaf tissue for ionic analysis may have been mitigated at sites 2 and 44 by the wetter-than-normal year in 1990. Forty-five species of herbaceous plants have been identified since studies were begun. Based on percent cover, dominant species include Euphorbia spp., Pectis papposa, Plantago insularis, and Sphaeralcea Coulteri. Of the five species of grass that were identified, Schismus spp. was seen most often within the study plots. No species of cacti were found in any of the salt bush communities.

Species richness within the salt bush communities was greater during the 1986-1990 monitoring period than the 1983-1985 period at all sites. Heterogeneity was greater at site 2 during the operational monitoring period than during the preoperational period; however, the opposite was true at site 44; at site 3, heterogeneity was equal for both monitoring periods. The index of similarity was highest at site 3 and lowest at site 44.

9.4 SOILS ANALYSES

This section presents statistical comparisons of soils analysis data at each of the 44 monitoring sites to determine if significant differences exist between 1990 and the preoperational period. Each soil sample was analyzed for 19 parameters, six of which were chosen as indicator parameters for the comparison of preoperational and 1990 data: electrical conductivity and soluble calcium, magnesium, sodium, potassium, and chloride. Indicator parameters were chosen on the basis of their expected concentration in cooling tower

basin water, their importance as plant nutrients or potential toxins, and the probability of their being found in detectable concentrations in drift deposition. For each of these parameters, mean values were calculated for individual sites using all sample data from 1990 and from 1983 through 1985, the operational and preoperational periods, respectively.

As described in the report for 1986 (NUS, 1987a), linear regression equations were used to extrapolate the results obtained from the 1983 and 1984 analytical methods for the purpose of comparing the preoperational and 1990 data.

Statistical comparisons of the data were computed with the Student's t-statistic, using a 95-percent confidence level, to test for significant differences between mean values of each indicator parameter. Mean values for individual monitoring locations were compared using the t-test, as were group means for all agricultural and native sites.

9.4.1 Agricultural Soils

Preoperational and 1990 mean values and standard errors for each indicator parameter for agricultural sites (sites 7, 11-13, 23-25, 28, 30-32, 43, and 45) are presented in Table 9-22. None of the mean values of the indicator parameters were significantly different in 1990 from the preoperational period.

The mean concentrations of indicator parameters for individual agricultural sites are given in Table 9-23. A comparison between preoperational and 1990 means shows that there were no significant differences for any of the indicator parameters at sites 23, 24, and 32. A significant increase in electrical conductivity was observed in 1990 for sites 12, 25, and 31, and a significant decrease was observed for sites 7, 30, and 45. No significant differences in electrical conductivity were observed at seven sites. Mean calcium values in 1990 were significantly higher at sites 12, 13, 25, 28, and 31 and significantly lower at site 30. No significant differences were observed for calcium at seven sites. Mean concentrations of magnesium in 1990 were significantly higher at sites 11, 13, and 25 and significantly lower at sites 7 and 30. No significant differences in magnesium concentrations were observed at eight sites. Sodium concentrations

significantly increased at sites 11 and 31 and significantly decreased at sites 7, 30, and 45 in 1990. No significant change in sodium content was observed at eight sites. Potassium concentrations were not observed to be significantly higher in 1990 over preoperational values at any site but were significantly lower at sites 30 and 43. No significant differences in potassium concentrations were observed at 11 sites. Chloride concentrations were significantly higher in 1990 at sites 11, 12, 25, and 31 and significantly lower at sites 30 and 45. No significant differences in chloride concentrations were observed at seven sites.

Monitoring locations which showed significant increases in one or more indicator parameters are found northwest (sites 11 and 12), north-northwest (site 13), south-southeast (site 31), and southwest (site 28) of the PVNGS site. The closest of these (site 11) is 2.0 miles from the centroid of the PVNGS cooling towers. A remote (control) site, site 25 (west-northwest and 19.0 miles from the towers), also exhibited significant increases in four parameters. Five of these locations (sites 11, 12, 25, 28, and 31) were fallow fields and one (site 13) was planted in cotton in 1990. Sites that showed significant decreases in one or more indicator parameters are found east-northeast (site 7), south-southwest (site 30), and southwest (site 45) of the PVNGS site. Remote (control) site 43 (south-southeast and 15.0 miles from the cooling towers) also showed a significant decrease in one parameter. Three of these locations (sites 7, 30, and 45) were fallow, and the last (control site 43) was planted in alfalfa in 1990.

These findings continue to indicate that significant changes in soluble salt content, as indicated by soil ion content at the agricultural monitoring sites, appear to reflect no spatial trend. It is most likely that irrigation practices, crop selection, and fertilizer application account for the statistical differences in the ion content of agricultural soils.

9.4.2 Native Soils

Table 9-24 presents the means and standard errors, based on 29 native sites, for each indicator parameter measured in 1990 and the preoperational period. Sites 3 and 16 were not used in calculating the means because they were identified as statistical outliers for several parameters (see Chapter 8).

The results of the t-test analysis indicate that the soluble ions of calcium, sodium, and chloride were significantly different in 1990 as compared to the preoperational period. In 1990, all three parameters were significantly higher.

Mean values for individual native sites for the preoperational period and 1990 are given in Table 9-25. There was no significant difference between preoperational and 1990 values for any parameter at 14 of the 31 native sites (1, 2, 3, 4, 8, 9, 10, 21, 22, 27, 36, 37, 39, and 44). These include six onsite locations (sites 1, 2, 3, 4, 10, and 27) as well as sites up to 15 miles away (site 37). Electrical conductivity values in 1990 were significantly higher than preoperational values at sites 19 and 38 and significantly lower at site 15. No significant differences were found at the remaining 28 sites. Calcium concentrations were significantly higher during 1990 at nine sites (sites 5, 6, 16, 17, 18, 19, 33, 35, and 42). There were no significant differences in calcium values at 22 of the 31 native sites. Magnesium values were significantly higher during 1990 at sites 16, 17, 19, 33, and 42. There were no significant differences at the remaining 26 sites. Sodium concentrations increased significantly in 1990 over preoperational values at sites 14, 40, and 42 and decreased significantly at site 35. There were no significant differences in sodium concentration at 27 of the 31 native sites. Potassium values were significantly higher during 1990 at sites 17 and 19 and significantly lower at sites 15 and 26. There were no differences at the remaining 27 sites. Chloride concentrations were significantly greater in 1990 than in the preoperational period at 10 sites (sites 17, 18, 19, 20, 26, 34, 35, 40, 41, and 42) and not significantly different at the other 21 native sites.

Sites 3, 14, 16, and 20 are the nearest soil monitoring sites to the cooling towers. It is expected that the soils at these sites would be the first to show effects of drift from the cooling towers. In particular, sites 16 and 20 would be expected to exhibit maximum deposition effects based on prevailing drift deposition modeling trends. The indicator parameters showing a significant change at these four sites were calcium, magnesium, sodium, and chloride. Calcium and magnesium concentrations were significantly higher in 1990 than in the preoperational period at site 16.

Sodium was significantly higher at site 14, and chloride was significantly higher at site 20. Significant increases in these indicator parameters were also observed at the two sites farthest from the PVNGS site (sites 40 and 42). Specifically, calcium and magnesium concentrations in 1990 were significantly higher than preoperational values at site 42 while sodium and chloride concentrations were significantly higher at both sites. This analysis would seem to indicate that there are influences on soil concentrations other than cooling tower drift deposition.

9.5 REMOTE SENSING/AERIAL PHOTOGRAPHY

Specifications and discussion of the 1990 color infrared photomission for PVNGS and its environs are presented in Section 7. Vegetative stress in agricultural crops and indigenous vegetation may be attributable to drought, poor drainage, nutrient deficiencies associated with varying soil fertility, disease or insect damage, weed competition, and other conditions that alter the normal physiology of a plant. Symptom conditions associated with salt deposition or uptake include chlorosis and necrosis of the leaves, shoot-tip dieback, leaf curl, slower growth, increased susceptibility to disease and insect damage, and changes in the structure and diversity in the plant community over time. Significant vegetative stress from drift deposition would appear on the color infrared imagery as a homogeneous tonal signature covering an entire field or a large portion thereof.

A comparison of the color infrared imagery for the preoperational period and 1990 revealed similar growth patterns at the monitoring sites. Areas of stress revealed by the 1990 photography proved to be a result of Texas root rot and nitrogen deficiency. Salt stress symptoms such as chlorosis and necrosis of the leaves were not observed during ground-truthing. Patterns of agricultural vegetative growth in PVNGS operational years have been consistent with those observed in preoperational years, suggesting that the observed variability was related not to PVNGS but rather to factors such as soil fertility, drainage, and agricultural practices.

9.6 SUMMARY AND CONCLUSIONS

As in 1989, the results obtained from elements of the 1990 drift monitoring program have been compared with the corresponding preoperational values. In a number of instances, there are clear indications of the effects of cooling tower emissions, particularly for deposition samples at monitoring sites within about 1 mile of the PVNGS cooling towers.

Beyond these rather unambiguous indications of drift deposition, however, the 1990 results from the other program elements are less definitive. As in 1989, although there are 1990 samples showing statistically significant changes in specific ion concentrations in soil, native vegetation, and crop samples, these appear not to follow consistently any spatial or temporal patterns that can be correlated with PVNGS operations.

The changes from preoperational background observed for four analytes in deposition, soil, and crop samples were compiled for the agricultural monitoring sites and are summarized in Table 9-26.

With these caveats, a review of the table indicates that

1. In 1990, only one cultivated site displayed significant changes in the same parameter (analyte) for all media sampled: calcium at site 13 for deposition, soil, and crop tissue samples. Site 23 evidenced increases in deposition of sodium, calcium, potassium, and magnesium which were also observed for sodium, calcium, and magnesium in crop tissue. However, soil at this site showed no change from the baseline period, nor did crop samples for potassium.

2. The major drift constituent, sodium, showed decreased deposition or no change from the preoperational period at all agricultural sites except for site 23.

3. Site 11, the closest of the agricultural sites, which had shown increases in the leaf tissue content of five ions in 1986 and in three ions in 1987, 1988, and 1989, showed increases in four ions over the background period in 1990. Statistically significant

increases were observed only for sodium and magnesium in the soil samples at this site.

For 1990, it can be concluded that the cooling tower operations resulted in detectable deposition levels onsite. However, these deposition levels cannot be correlated with changes in soil and/or vegetation concentrations of the same analytes, nor can any soil structure or crop effects be identified that are attributable to the deposition measured in the offsite area.

Based on an analysis of these results, as well as those obtained since the operational program began in 1985, a recommendation for reduction of the scope of the monitoring program has been presented to APS (NUS, 1991b).

Table 9-1. Monthly average meteorological data for PVNGS, 1990 versus 1974-1985

Month	Temperature (°F)*		Dew point (°F)*		Precipitation (in.)†		Wind speed (mph)*	
	1990	1974-1985	1990	1974-1985	1990	1974-1985	1990	1974-1985
January	51	52	30	33	1.09	0.58	4.7	4.8
February	53	56	27	32	0.11	0.59	6.0	5.5
March	64	61	28	34	0.09	0.82	6.8	6.7
April	73	68	35	31	0.04	0.19	7.6	7.3
May	77	78	30	35	0.04	0.12	7.9	7.7
June	91	89	36	37	0.00	0.03	7.5	7.7
July	91	92	60	57	0.54	0.64	7.8	7.8
August	88	90	56	56	1.92	0.53	7.7	7.1
September	84	85	56	53	0.72	0.59	6.8	6.8
October	74	72	35	42	0.36	0.60	5.4	5.6
November	61	59	27	33	0.00	0.74	5.6	5.1
December	49	52	19	33	0.24	0.70	5.2	4.6
Annual	71	71	37	40	5.15	6.13	6.6	6.4

*Based on measurement at 35 feet.

†Annual precipitation is sum of monthly totals.

Table 9-2. Monthly average meteorological data for NWS Phoenix, 1990 versus 1950-1980

Month	Temperature (°F)*		Dew point (°F)*		Precipitation (in.)		Wind speed (mph)†	
	1990	1950-1980	1990	1950-1980‡	1990	1950-1980	1990	1950-1980
January	56	52	31	--	0.80	0.73	5.2	5.3
February	57	56	32	--	0.70	0.59	5.9	5.9
March	67	61	33	--	0.35	0.81	6.0	6.7
April	76	68	41	--	0.17	0.27	7.1	7.0
May	81	77	35	--	0.16	0.14	7.4	7.1
June	94	87	42	--	0.04	0.17	7.1	6.9
July	94	92	63	--	1.05	0.74	7.3	7.1
August	91	90	59	--	2.70	1.02	6.4	6.6
September	88	85	61	--	1.11	0.64	5.2	6.3
October	79	73	40	--	0.04	0.63	4.7	5.9
November	66	61	37	--	0.15	0.54	4.7	5.4
December	54	53	29	--	0.46	0.83	5.0	5.2
Annual	75	71	42	--	7.73	7.11	6.0	6.3

*Based on measurement at 5 feet.

†Based on measurement at 33 feet.

‡National Weather Service does not keep climatological records of dew point.

Table 9-3. Annual mean deposition (lb/(acre)(yr)) of drift constituents at PVNGS agricultural monitoring sites, preoperational period and 1990 (means ± standard errors)

Parameter	Preoperational* (n = 770)	1990 (n = 298)
Sodium	7.9 ± 0.3[a]	7.0 ± 0.5[a]
Potassium	8.6 ± 0.4	7.1 ± 0.6
Calcium	23.6 ± 0.8	34.1 ± 2.6
Magnesium	6.3 ± 0.3	10.5 ± 1.1
TSS	575.4 ± 29.2	864.7 ± 92.5

Key:
1. For individual parameters, means with superscript "a" are not significantly different at 95-percent confidence level.
2. TSS, total suspended solids.

*May 1983 through December 1985.

Table 9-4. Annual deposition (lb/(acre)(yr)) of sodium, potassium, and calcium at PVNGS agricultural monitoring sites, preoperational period and 1990 (means ± standard errors)

Site	Sodium		Potassium		Calcium	
	Preoperational*	1990	Preoperational*	1990	Preoperational*	1990
7	4.9 ± 0.6[a]	3.9 ± 0.4[a]	5.1 ± 0.5	3.1 ± 0.4	16.8 ± 1.6[a]	22.9 ± 6.4[a]
11	6.7 ± 0.6[a]	5.0 ± 0.6[a]	8.6 ± 0.8	4.8 ± 0.9	21.1 ± 1.7[a]	25.7 ± 3.5[a]
12	7.9 ± 1.2	4.9 ± 0.9	6.0 ± 0.9[a]	6.5 ± 1.5[a]	13.4 ± 1.2[a]	19.6 ± 2.8[a]
13	7.0 ± 0.9[a]	6.9 ± 1.0[a]	6.3 ± 0.7[a]	7.3 ± 1.1[a]	20.4 ± 2.4	32.3 ± 5.2
23	6.8 ± 0.8	12.7 ± 1.7	12.7 ± 1.6	33.1 ± 4.3	37.8 ± 4.0	145.5 ± 16.8
24	7.9 ± 1.2[a]	4.8 ± 1.2[a]	7.9 ± 1.3	3.4 ± 0.5	20.8 ± 2.9[a]	16.5 ± 1.6[a]
25	8.1 ± 1.0	3.6 ± 0.3	11.3 ± 1.0	5.1 ± 0.9	32.4 ± 2.1	14.2 ± 1.7
28	5.6 ± 0.5[a]	5.2 ± 1.1[a]	4.9 ± 0.6	2.7 ± 0.4	26.7 ± 3.2[a]	33.9 ± 7.1[a]
30	9.6 ± 0.8[a]	8.4 ± 0.7[a]	11.5 ± 1.4[a]	9.4 ± 1.2[a]	39.5 ± 3.5[a]	47.2 ± 5.4[a]
31	8.6 ± 0.7[a]	10.3 ± 4.3[a]	5.7 ± 0.6	3.0 ± 0.6	15.3 ± 1.3[a]	18.0 ± 2.7[a]
32	8.0 ± 0.8[a]	9.1 ± 2.0[a]	6.6 ± 0.8[a]	7.1 ± 1.2[a]	18.3 ± 1.8	34.2 ± 5.9
43	9.8 ± 1.1[a]	11.0 ± 3.6[a]	9.9 ± 1.1	4.9 ± 0.6	12.3 ± 1.0[a]	14.7 ± 1.2[a]
45	12.4 ± 1.6	4.9 ± 0.4	19.6 ± 5.2	3.3 ± 0.4	39.5 ± 7.5[a]	23.9 ± 5.8[a]

Key: For individual ions at each site, means with superscript "a" are not significantly different at 95-percent confidence level.

*May 1983 through December 1985.

Table 9-5. Annual mean deposition (lb/(acre)(yr)) of drift constituents at PVNGS native monitoring sites, preoperational period and 1990 (means ± standard errors)

Parameter	Preoperational* (n = 1835)	1990 (n = 820)
Sodium	5.7 ± 0.1	7.0 ± 0.3
Potassium	4.3 ± 0.1	3.3 ± 0.1
Calcium	11.1 ± 0.3	17.7 ± 1.0
Magnesium	2.6 ± 0.1	4.9 ± 0.2
TSS	228.2 ± 5.7	423.4 ± 19.2

Key:
1. For all parameters, means are significantly different at 95-percent confidence level.
2. TSS, total suspended solids.

*May 1983 through December 1985.

Table 9-6. Annual mean deposition (lb/(acre)(yr)) of drift constituents at PVNGS supplemental monitoring sites, preoperational period and 1990 (means ± standard errors)

Parameter	Preoperational* (n = 662)	1990 (n = 92)
Sodium	5.7 ± 0.2	16.7 ± 1.5
Potassium	4.3 ± 0.2[a]	4.0 ± 0.4[a]
Calcium	13.0 ± 0.5	39.7 ± 7.2
Magnesium	3.1 ± 0.2	9.0 ± 1.4
TSS	248.2 ± 12.0	638.5 ± 92.3

Key:
1. For individual parameters, means with superscript "a" are not significantly different at 95-percent confidence level.
2. TSS, total suspended solids.

*May 1983 through December 1985.

Table 9-7. Annual mean deposition (lb/(acre)(yr)) of drift constituents at PVNGS native monitoring sites (excluding supplemental sites) within 1 mile of PVNGS, preoperational period and 1990 (means ± standard errors)

Parameter	Preoperational* (n = 206)	1990 (n = 95)
Sodium	6.0 ± 0.3	12.3 ± 1.7
Potassium	4.7 ± 0.3	3.7 ± 0.3
Calcium	16.4 ± 1.1[a]	21.1 ± 2.3[a]
Magnesium	3.9 ± 0.4	5.6 ± 0.5
TSS	307.7 ± 22.2	435.3 ± 43.7

Key:
1. For individual parameters, means with superscript "a" are not significantly different at 95-percent confidence level.
2. TSS, total suspended solids.

*May 1983 through December 1985.

Table 9-8. Annual mean deposition (lb/(acre)(yr)) of drift constituents at native monitoring sites 1 to 2 miles from PVNGS, preoperational period and 1990 (means ± standard errors)

Parameter	Preoperational* (n = 381)	1990 (n = 139)
Sodium	5.7 ± 0.3[a]	6.1 ± 0.6[a]
Potassium	3.9 ± 0.2	3.0 ± 0.2
Calcium	11.1 ± 0.5	16.8 ± 1.0
Magnesium	2.5 ± 0.1	4.8 ± 0.4
TSS	206.6 ± 9.7	418.2 ± 40.4

Key:
1. For individual parameters, means with superscript "a" are not significantly different at 95-percent confidence level.
2. TSS, total suspended solids.

*May 1983 through December 1985.

Table 9-9. Annual mean deposition (lb/(acre)(yr)) of drift constituents at native monitoring sites more than 2 miles from PVNGS, preoperational period and 1990 (means ± standard errors)

Parameter	Preoperational* (n = 1233)	1990 (n = 494)
Sodium	5.6 ± 0.2	4.4 ± 0.2
Potassium	4.4 ± 0.1	3.1 ± 0.1
Calcium	10.3 ± 0.3	13.1 ± 0.5
Magnesium	2.4 ± 0.1	4.1 ± 0.2
TSS	221.7 ± 7.0	382.5 ± 22.5

Key: TSS, total suspended solids.

*May 1983 through December 1985.

Note: For all parameters, means of preoperational and 1990 values are significantly different at 95-percent confidence level.

Table 9-10. Annual deposition (lb/(acre)(yr)) of sodium, potassium, and calcium at PVNGS native monitoring sites, preoperational period and 1990 (means ± standard errors) (sheet 1 of 2)

Site	Sodium		Potassium		Calcium	
	Preoperational*	1990	Preoperational*	1990	Preoperational*	1990
1	5.4 ± 0.6[a]	5.1 ± 0.5[a]	4.0 ± 0.5[a]	2.7 ± 0.4[a]	10.4 ± 0.7[a]	14.0 ± 1.8[a]
2	5.9 ± 0.6[a]	5.4 ± 0.6[a]	4.1 ± 0.5[a]	2.9 ± 0.4[a]	9.2 ± 0.7[a]	13.3 ± 2.2[a]
3	6.4 ± 0.6[a]	11.2 ± 3.7[a]	5.2 ± 0.6[a]	4.4 ± 0.6[a]	15.8 ± 2.8[a]	22.4 ± 2.4[a]
4	5.1 ± 0.6[a]	5.7 ± 1.2[a]	4.7 ± 0.7[a]	3.4 ± 0.4[a]	10.8 ± 1.1	17.5 ± 2.0
5	5.5 ± 0.6[a]	5.6 ± 0.7[a]	4.2 ± 0.6	2.8 ± 0.3	13.5 ± 1.9[a]	19.0 ± 3.1[a]
6	6.6 ± 0.6[a]	8.9 ± 3.2[a]	3.4 ± 0.3[a]	3.0 ± 0.5[a]	10.6 ± 1.0	16.6 ± 2.4
8	5.7 ± 0.7[a]	4.9 ± 0.5[a]	4.5 ± 0.8	2.6 ± 0.2	9.3 ± 1.0[a]	13.2 ± 1.9[a]
9	6.0 ± 0.7[a]	6.1 ± 0.8[a]	4.4 ± 0.5[a]	3.6 ± 0.5[a]	11.8 ± 1.5	22.2 ± 3.2
10	5.1 ± 0.6[a]	5.6 ± 0.7[a]	3.3 ± 0.3[a]	3.1 ± 0.5[a]	11.1 ± 1.3[a]	15.6 ± 2.0[a]
14	6.5 ± 0.8[a]	8.0 ± 1.1[a]	4.7 ± 0.5	3.0 ± 0.5	22.5 ± 2.0[a]	30.2 ± 7.9[a]
15	5.7 ± 0.6	3.7 ± 0.4	4.0 ± 0.4[a]	2.9 ± 0.4[a]	9.4 ± 0.7	15.4 ± 2.1
16	5.8 ± 0.7[a]	8.4 ± 1.2[a]	3.6 ± 0.4[a]	3.2 ± 0.4[a]	12.2 ± 1.1[a]	17.4 ± 3.1[a]
17	6.3 ± 0.9	4.0 ± 0.4	5.7 ± 0.6	3.0 ± 0.6	13.2 ± 1.5	9.4 ± 1.0
18	4.6 ± 0.5[a]	5.6 ± 0.8[a]	3.3 ± 0.3[a]	2.6 ± 0.3[a]	9.4 ± 0.9[a]	11.6 ± 1.7[a]
19	5.3 ± 0.7[a]	7.0 ± 1.0[a]	5.4 ± 0.6	9.7 ± 1.9	13.4 ± 1.3	34.8 ± 5.7
20	4.9 ± 0.6	21.5 ± 4.9	5.3 ± 0.7[a]	4.3 ± 0.4[a]	11.7 ± 0.9[a]	14.6 ± 2.0[a]
21	5.8 ± 1.0[a]	3.8 ± 0.3[a]	3.9 ± 0.4	2.4 ± 0.3	14.9 ± 3.6[a]	11.1 ± 0.9[a]
22	4.7 ± 0.5	3.0 ± 0.3	4.1 ± 0.6	2.4 ± 0.3	9.0 ± 0.6[a]	11.6 ± 1.4[a]
26	6.4 ± 0.9[a]	4.9 ± 0.8[a]	3.5 ± 0.4[a]	2.7 ± 0.4[a]	9.8 ± 0.7[a]	11.9 ± 1.1[a]
27	5.4 ± 0.5[a]	5.1 ± 0.6[a]	5.3 ± 0.7	3.1 ± 0.6	14.0 ± 2.3[a]	12.5 ± 1.8[a]
33	6.0 ± 0.6[a]	8.4 ± 3.3[a]	5.2 ± 0.6	3.0 ± 0.5	11.5 ± 1.1[a]	14.9 ± 2.0[a]
34	5.7 ± 0.6	3.1 ± 0.3	4.0 ± 0.5	1.9 ± 0.2	7.5 ± 0.6[a]	9.4 ± 0.9[a]
35	5.8 ± 0.9	3.1 ± 0.3	6.0 ± 0.8	3.2 ± 0.4	11.5 ± 1.3[a]	14.3 ± 2.1[a]
36	4.9 ± 0.6	3.0 ± 0.3	3.4 ± 0.3	2.3 ± 0.3	6.9 ± 0.5[a]	8.8 ± 1.0[a]

Table 9-10. Annual deposition (lb/(acre)(yr)) of sodium, potassium, and calcium at PVNGS native monitoring sites, preoperational period and 1990 (means ± standard errors) (sheet 2 of 2)

Site	Sodium		Potassium		Calcium	
	Preoperational*	1990	Preoperational*	1990	Preoperational*	1990
37	5.5 ± 0.7[a]	7.0 ± 2.2[a]	3.7 ± 0.5[a]	2.8 ± 0.6[a]	7.1 ± 0.5[a]	8.9 ± 0.7[a]
38	6.2 ± 0.7	2.9 ± 0.3	5.1 ± 0.7	1.9 ± 0.3	8.6 ± 0.7[a]	9.6 ± 1.3[a]
39	6.0 ± 0.8	3.0 ± 0.2	4.3 ± 0.6	2.3 ± 0.3	9.0 ± 0.8[a]	7.5 ± 0.7[a]
40	6.0 ± 0.7	3.5 ± 0.4	4.5 ± 0.4[a]	4.7 ± 0.7[a]	12.8 ± 1.0[a]	15.7 ± 2.0[a]
41	6.2 ± 0.9	4.0 ± 0.3	4.7 ± 0.8	2.5 ± 0.3	11.9 ± 1.5[a]	15.6 ± 2.7[a]
42	5.3 ± 0.6	3.4 ± 0.2	3.7 ± 0.7[a]	2.4 ± 0.2[a]	7.6 ± 0.5[a]	9.1 ± 1.0[a]
44	6.0 ± 1.0[a]	3.9 ± 0.4[a]	3.4 ± 0.6[a]	3.6 ± 0.5[a]	7.8 ± 0.7	13.4 ± 1.5
80	5.7 ± 0.2	17.8 ± 3.3	4.3 ± 0.2[a]	6.1 ± 1.5[a]	13.0 ± 0.5	97.2 ± 26.5
81	5.7 ± 0.2	21.8 ± 3.5	4.3 ± 0.2[a]	3.8 ± 0.5[a]	13.0 ± 0.5	21.0 ± 2.9
82	5.7 ± 0.2	13.2 ± 2.4	4.3 ± 0.2	3.2 ± 0.5	13.0 ± 0.5	21.2 ± 3.2
83	5.7 ± 0.2	13.8 ± 2.3	4.3 ± 0.2	3.1 ± 0.3	13.0 ± 0.5	22.9 ± 2.4

Key: For individual ions at each site, means with superscript "a" are not significantly different at 95-percent confidence level.

*May 1983 through December 1985.

Table 9-11. Annual mean deposition (lb/(acre)(yr)) of drift constituents at PVNGS agricultural and native monitoring control sites, preoperational period and 1990 (means ± standard errors)

Parameter	Agricultural control sites (sites 25 and 43)		Native control sites (sites 40 and 42)	
	Preoperational* (n = 120)	1990 (n = 46)	Preoperational* (n = 119)	1990 (n = 48)
Sodium	8.9 ± 0.7[a]	7.5 ± 1.9[a]	5.7 ± 0.5	3.4 ± 0.2
Potassium	10.6 ± 0.7	5.0 ± 0.5	4.1 ± 0.4[a]	3.5 ± 0.4[a]
Calcium	22.5 ± 1.5	14.4 ± 1.0	10.4 ± 0.6[a]	12.4 ± 1.2[a]
Magnesium	7.4 ± 0.6	4.9 ± 0.5	2.9 ± 0.3	4.5 ± 0.6
TSS	728.9 ± 57.4	415.4 ± 58.7	264.1 ± 22.9	410.9 ± 54.4

Key:
1. For individual parameters, means with superscript "a" are not significantly different at 95-percent confidence level.
2. TSS, total suspended solids.

*May 1983 through December 1985.

Table 9-12. Net drift deposition (lb/(acre)(yr)) for PVNGS onsite monitoring sites, 1990 (means ± standard errors)

	Deposition			
Site	Sodium 1990	Sodium preoperational*	Net sodium 1990	Net TDS 1990†
1	5.1 ± 0.5	5.4 ± 0.6	-0.3 ± 0.8	-1.0 ± 2.7
2	5.4 ± 0.6	5.9 ± 0.6	-0.5 ± 0.8	-1.7 ± 2.7
3	11.2 ± 3.7	6.4 ± 0.6	4.8 ± 3.7	15.8 ± 12.2
4	5.7 ± 1.2	5.1 ± 0.6	0.6 ± 1.3	2.0 ± 4.3
5	5.6 ± 0.7	5.5 ± 0.6	0.1 ± 0.9	0.3 ± 2.7
6	8.9 ± 3.2	6.6 ± 0.6	2.3 ± 3.3	7.6 ± 10.9
10	5.6 ± 0.7	5.1 ± 0.6	0.5 ± 0.9	1.7 ± 3.1
14	8.0 ± 1.1	6.5 ± 0.8	1.5 ± 1.4	5.0 ± 4.7
16	8.4 ± 1.2	5.8 ± 0.7	2.6 ± 1.4	8.6 ± 4.6
20	21.5 ± 4.9	4.9 ± 0.6	16.6 ± 4.9	54.8 ± 16.2
27	5.1 ± 0.6	5.4 ± 0.5	-0.3 ± 0.8	-1.0 ± 2.7
80	17.8 ± 3.3	5.7 ± 0.2	12.1 ± 3.3	39.9 ± 10.9
81	21.8 ± 3.5	5.7 ± 0.2	16.1 ± 3.5	53.1 ± 11.6
82	13.2 ± 2.4	5.7 ± 0.2	7.5 ± 2.4	24.8 ± 8.0
83	13.8 ± 2.3	5.7 ± 0.2	8.1 ± 2.3	26.7 ± 7.6

*May 1983 through December 1985.

†Based on scaling measured sodium deposition at each monitoring site by ratio of total dissolved solids to sodium (3.3 ± 0.09) as determined from monthly 1990 cooling tower basin water samples from Units 1-3.

Table 9-13. Measured versus predicted drift deposition (lb/(acre)(year)) at PVNGS onsite monitoring sites, 1990

Site	Net deposition* (measured)	FOG-code-predicted total deposition	Measured/ predicted (ratio)
1	-1.0 ± 2.7†	7.56	NC
2	-1.7 ± 2.7†	4.89	NC
3	15.8 ± 12.2	8.21	1.9
4	2.0 ± 4.3†	6.77	NC
5	0.3 ± 2.7†	2.17	NC
6	7.6 ± 10.9†	2.60	NC
10	1.7 ± 3.1†	3.12	NC
14	5.0 ± 4.7	19.2	0.26
16	8.6 ± 4.6	159.0	0.05
20	54.8 ± 16.2	82.7	0.66
27	-1.0 ± 2.7†	6.43	NC
80	39.9 ± 10.9	89.3	0.45
81	53.1 ± 11.6	4960.0	0.01
82	24.8 ± 8.0	162.0	0.15
83	26.7 ± 7.6	83.9	0.32
Mean ratio			0.48

Key: NC, not calculated.

*Means ± standard errors.

†Not significantly different from zero.

Note: Correlation analysis based on following equation:

$$y = A + BX$$

where

y = measured deposition
A = 12.6 (intercept)
B = 0.008 (slope)
X = predicted deposition
Correlation coefficient (R^2) = 0.29

Table 9-14. Sequence of crops planted at PVNGS agricultural monitoring sites, 1983-1990

Monitoring site	1983	1984	1985	1986	1987	1988	1989	1990
7	SS cotton	Fallow	Fallow	Fallow	Fallow	Fallow	Fallow	Fallow
11	SS cotton	SS cotton*	SS cotton	SS cotton	SS cotton	SS cotton	SS cotton	SS cotton
12	SS cotton	SS cotton	SS cotton	Fallow	Fallow	Fallow	Fallow	Fallow
13	Sorghum	SS cotton	SS cotton	SS cotton	SS cotton	SS cotton	SS cotton	SS cotton
23	SS cotton	SS cotton	SS cotton	Alfalfa	Alfalfa	Alfalfa	LS cotton	SS cotton
24	Fallow	LS cotton*	LS cotton	Fallow	Fallow	Fallow	Fallow	Fallow
25	LS cotton	LS cotton	LS cotton	LS cotton	LS cotton	LS cotton	LS cotton	Fallow
28	Fallow	SS cotton*	Fallow	Fallow	Fallow	Fallow	Fallow	Fallow
29†	Alfalfa	--	--	--	--	--	--	--
30	Melon	Fallow	Barley/ SS cotton	SS cotton	Alfalfa	SS cotton	SS cotton	SS cotton*
31	SS cotton	SS cotton	SS cotton	SS cotton	SS cotton	LS cotton	Fallow	Fallow
32	SS cotton	SS cotton	SS cotton	Fallow	SS cotton	LS cotton	Fallow	Fallow
43	Alfalfa	Alfalfa‡	Alfalfa	Alfalfa	Alfalfa	Alfalfa	Alfalfa	Alfalfa
45§	--	SS cotton	Alfalfa	Fallow	Fallow	Fallow	Fallow	Fallow

Key: SS cotton, short-staple (upland) cotton; LS cotton, long-staple (Pima) cotton.

*Monitoring site was fallow; field in immediate vicinity was sampled.

†Discontinued after 1983 growing season.

‡Planted, but not sampled.

§Established in 1984.

Table 9-15. Preoperational and 1990 mean ion content (μg/g dry weight) of alfalfa leaf tissue at PVNGS monitoring site 43 (means ± standard errors)

Ion	1983, 1985 (n = 40)	1990 (n = 20)
Sodium	1,547 ± 129[a]	1,669 ± 87[a]
Potassium	22,194 ± 944[a]	24,925 ± 1,248[a]
Calcium	12,026 ± 424	13,802 ± 489
Magnesium	2,705 ± 77[a]	2,935 ± 99[a]
Chloride	11,951 ± 606[a]	12,450 ± 357[a]
Sulfate	11,283 ± 1,080[a]	9,066 ± 746[a]
Nitrate (as N)	302 ± 59[a]	281 ± 58[a]
Phosphate (as P)	3,010 ± 91	3,793 ± 218
Fluoride	14.1 ± 1.7[a]	13.5 ± 0.1[a]

Key: For individual ions, means with superscript "a" are not significantly different at 95-percent confidence level.

Table 9-16. Preoperational and 1990 ionic content (µg/g dry weight) of short-staple cotton leaf tissue at PVNGS monitoring sites (means ± standard errors)

Ion	Site 11		Site 13		Site 23		Site 30	
	1983-1985	1990	1984-1985	1990	1983-1985	1990	1985	1990
Sodium	2,159 ± 149 (n = 50)	3,307 ± 407 (n = 20)	3,310 ± 271[a] (n = 40)	3,308 ± 397[a] (n = 20)	1,655 ± 130 (n = 60)	2,892 ± 247 (n = 20)	2,553 ± 208 (n = 20)	1,899 ± 143 (n = 20)
Potassium	15,312 ± 647 (n = 50)	18,289 ± 910 (n = 20)	16,943 ± 592[a] (n = 40)	17,750 ± 1,247[a] (n = 20)	17,900 ± 685[a] (n = 60)	18,854 ± 872[a] (n = 20)	17,423 ± 781 (n = 20)	19,683 ± 784 (n = 20)
Calcium	30,187 ± 997 (n = 50)	39,675 ± 1,203 (n = 20)	33,836 ± 1,038 (n = 40)	45,403 ± 2,073 (n = 20)	34,524 ± 1,316 (n = 60)	46,831 ± 1,103 (n = 20)	38,103 ± 1,587 (n = 20)	43,506 ± 1,614 (n = 20)
Magnesium	4,612 ± 122 (n = 50)	5,360 ± 220 (n = 20)	5,378 ± 170[a] (n = 40)	5,954 ± 289[a] (n = 20)	5,570 ± 126 (n = 60)	6,805 ± 280 (n = 20)	5,463 ± 227 (n = 20)	6,425 ± 215 (n = 20)
Chloride	13,617 ± 341 (n = 50)	16,790 ± 571 (n = 20)	16,377 ± 597 (n = 40)	22,260 ± 814 (n = 20)	18,562 ± 778[a] (n = 60)	16,704 ± 466[a] (n = 20)	21,350 ± 1,573 (n = 20)	15,950 ± 417 (n = 20)
Sulfate	30,560 ± 1,418 (n = 50)	40,214 ± 3,272 (n = 20)	33,600 ± 1,741 (n = 40)	46,908 ± 2,594 (n = 20)	67,296 ± 12,647[a] (n = 60)	43,426 ± 4,763[a] (n = 20)	41,513 ± 3,240[a] (n = 20)	42,318 ± 3,611[a] (n = 20)
Nitrate (as N)	653 ± 97 (n = 40)	117 ± 20 (n = 20)	715 ± 136 (n = 32)	115 ± 30 (n = 20)	1,288 ± 234 (n = 52)	276 ± 74 (n = 20)	1,341 ± 302 (n = 20)	233 ± 72 (n = 20)
Phosphate (as P)	2,425 ± 107[a] (n = 50)	2,308 ± 132[a] (n = 20)	1,831 ± 103 (n = 40)	2,611 ± 205 (n = 20)	2,928 ± 177[a] (n = 60)	2,403 ± 115[a] (n = 20)	2,018 ± 185 (n = 20)	2,550 ± 128 (n = 20)
Fluoride	89.3 ± 54.6[a] (n = 42)	16.3 ± 0.6[a] (n = 20)	142 ± 64[a] (n = 24)	15.9 ± 0.4[a] (n = 20)	43.3 ± 17.1[a] (n = 42)	15.5 ± 0.9[a] (n = 20)	29.4 ± 5.3 (n = 20)	15.2 ± 1.0 (n = 20)

Key: For individual ions at same site, means with superscript "a" are not significantly different at 95-percent confidence level.

Table 9-17. Mean cotton yield (lb/acre) at PVNGS agricultural monitoring sites, 1983-1990 (means ± standard errors)

Monitoring site	1983	1984	1985	1986	1987	1988	1989	1990
7	749 ± 127	Fallow	Fallow	Fallow	Fallow	Fallow	Fallow	Fallow
11	2514 ± 184^{a}	ND*	ND	ND	3736 ± 225	2535 ± 188^{a}	2450 ± 337^{a}	2561 ± 194^{a}
12	ND	2787 ± 139^{a}	2314 ± 208^{a}	Fallow	Fallow	Fallow	Fallow	Fallow
13	Sorghum	3201 ± 99^{ab}	ND	3029 ± 194^{a}	3608 ± 170^{b}	4610 ± 204^{c}	4549 ± 168^{c}	2538 ± 143
23	2463 ± 304^{a}	1375 ± 128^{b}	1894 ± 299^{ab}	Alfalfa	Alfalfa	Alfalfa	2968 ± 198†	3666 ± 191
24	Fallow	948 ± 57^{a}	1423 ± 356^{a}	Fallow	Fallow	Fallow	Fallow	Fallow
25	2088 ± 162^{bc}	1460 ± 68^{a}	2880 ± 220^{d}	1970 ± 354^{abc}	1733 ± 167^{ab}	1925 ± 142^{abc}	2343 ± 139^{cd}	Fallow
28	Fallow	1595 ± 64	Fallow	Fallow	Fallow	Fallow	Fallow	Fallow
30	Melon	Fallow	2470 ± 163^{a}	1569 ± 52	Alfalfa	3051 ± 479^{a}	2633 ± 323^{a}	2676 ± 207^{a}
31	1860 ± 210	1330 ± 178^{a}	1169 ± 142^{a}	1205 ± 78^{a}	1229 ± 72^{a}	684 ± 146‡	Fallow	Fallow
32	1316 ± 173^{a}	2486 ± 189	2002 ± 213	Fallow	866 ± 89^{a}	379 ± 90‡	Fallow	Fallow
43	Alfalfa	Alfalfa	Alfalfa	Alfalfa	Alfalfa	Alfalfa	Alfalfa	Alfalfa
45	NA§	2294 ± 184	Alfalfa	Fallow	Fallow	Fallow	Fallow	Fallow

Key: For yields at same site, means with same superscript letter are not significantly different at 95-percent confidence level.

*No data; field harvested prior to sampling.

†Not comparable with other sample data, since long-staple cotton was planted in 1989 and short-staple cotton was planted in all other years.

‡Not directly comparable with data for previous years, since long-staple cotton was planted in 1988 and short-staple cotton was planted earlier.

§Data not available; site established in 1984.

Note: All values were derived from analysis of 10 samples.

Table 9-18. Preoperational and 1990 ionic content (µg/g dry weight) of creosote bush (*Larrea divaricata*) leaf tissue at PVNGS monitoring sites (means ± standard errors)

Ion	Site 1		Site 4		Site 6		Site 40		Site 42	
	1983-1985	1990	1983-1985	1990	1983-1985	1990	1983-1985	1990	1983-1985	1990
Sodium	309 ± 28[a] (n = 50)	345 ± 19[a] (n = 20)	357 ± 27[a] (n = 50)	356 ± 27[a] (n = 20)	291 ± 26[a] (n = 49)	296 ± 23[a] (n = 20)	403 ± 108[a] (n = 49)	361 ± 28[a] (n = 20)	304 ± 28[a] (n = 41)	280 ± 17[a] (n = 20)
Potassium	8,589 ± 448 (n = 50)	13,457 ± 451 (n = 20)	13,876 ± 488 (n = 50)	16,214 ± 547 (n = 20)	10,579 ± 538 (n = 50)	14,025 ± 506 (n = 20)	11,154 ± 678 (n = 50)	14,726 ± 497 (n = 20)	10,906 ± 639[a] (n = 50)	12,116 ± 631[a] (n = 20)
Calcium	16,117 ± 694[a] (n = 50)	18,102 ± 667[a] (n = 20)	13,307 ± 307 (n = 50)	15,549 ± 554 (n = 20)	16,972 ± 503 (n = 50)	19,790 ± 629 (n = 20)	17,250 ± 3,010[a] (n = 50)	16,094 ± 490[a] (n = 20)	16,348 ± 1,816[a] (n = 50)	18,543 ± 559[a] (n = 20)
Magnesium	1,523 ± 59[a] (n = 50)	1,458 ± 53[a] (n = 20)	1,388 ± 39[a] (n = 50)	1,441 ± 40[a] (n = 20)	1,681 ± 62[a] (n = 50)	1,892 ± 99[a] (n = 20)	1,424 ± 94[a] (n = 50)	1,570 ± 93[a] (n = 20)	1,488 ± 89[a] (n = 50)	1,489 ± 40[a] (n = 20)
Chloride	6,086 ± 259 (n = 50)	8,010 ± 358 (n = 20)	6,462 ± 347 (n = 50)	8,230 ± 366 (n = 20)	6,609 ± 244 (n = 50)	8,660 ± 285 (n = 20)	6,691 ± 277[a] (n = 50)	6,260 ± 219[a] (n = 20)	7,072 ± 324 (n = 50)	8,900 ± 409 (n = 20)
Sulfate	17,538 ± 1,687 (n = 50)	3,685 ± 540 (n = 13)	8,680 ± 528 (n = 50)	5,519 ± 841 (n = 16)	8,894 ± 550 (n = 50)	4,113 ± 567 (n = 18)	11,484 ± 744 (n = 50)	4,647 ± 780 (n = 11)	15,042 ± 1,548 (n = 50)	4,715 ± 530 (n = 17)
Nitrate (as N)	1,373 ± 317 (n = 39)	121 ± 10 (n = 20)	436 ± 73 (n = 40)	157 ± 17 (n = 20)	389 ± 61 (n = 39)	151 ± 13 (n = 20)	433 ± 70 (n = 39)	122 ± 14 (n = 20)	439 ± 65 (n = 38)	130 ± 12 (n = 20)
Phosphate (as P)	969 ± 28 (n = 50)	1,383 ± 49 (n = 20)	1,106 ± 35 (n = 50)	1,426 ± 35 (n = 20)	1,411 ± 42 (n = 50)	1,729 ± 49 (n = 20)	1,464 ± 72 (n = 50)	1,739 ± 70 (n = 20)	1,330 ± 41[a] (n = 50)	1,362 ± 59[a] (n = 20)
Fluoride	14 8 ± 1.4[a] (n = 30)	17.3 ± 1.0[a] (n = 20)	13.0 ± 1.6[a] (n = 29)	14.0 ± 0.5[a] (n = 20)	12.4 ± 1.4 (n = 32)	16.5 ± 0.6 (n = 20)	12.6 ± 1.4 (n = 30)	16.3 ± 0.6 (n = 20)	14.3 ± 1.1[a] (n = 30)	16.3 ± 0.2[a] (n = 20)

Key: For individual ions at same site, means with superscript "a" are not significantly different at 95-percent confidence level.

Table 9-19. Species composition, cover, and diversity of flora in five creosote bush (Larrea divaricata) communities during preoperational (1983-1985) and operational (1986-1990) periods at PVNGS monitoring sites (sheet 1 of 5)

Parameter		Site 1		Site 4		Site 6		Site 40		Site 42	
		Preop*	Op	Preop	Op	Preop	Op	Preop	Op	Preop	Op
Species composition and percent cover											
Shrubs											
<u>Ambrosia dumosa</u>†	White bursage‡	1.1	1.7								
<u>Larrea divaricata</u>	Creosote bush; greasewood	18.2	17.0	13.4	12.5	20.2	18.1	12.4	12.2	17.4	17.7
Herbs											
<u>Allionia incarnata</u>	Trailing four-o'clock; windmills				--				0.5		
<u>Amsinckia intermedia</u>	Coast fiddleneck	0.5	0.3	<0.1	<0.1	1.4	0.8	--	0.1	0.1	0.1
<u>Argythamnia neomexicana</u>	None	--	--								
<u>Astragalus Nuttallianus</u>	Nuttall locoweed			<0.1	0.1	<0.1	<0.1		<0.1		<0.1
<u>Bowlesia incana</u>	Hairy bowlesia		<0.1								
<u>Brassica Tournefortii</u>	Mustard		<0.1	--	0.2		<0.1		<0.1		
<u>Camelina microcarpa</u>	Little pod			<0.1							
<u>Chaenactis carphoclinia</u>	Pebble pincushion	0.2	<0.1	0.2	0.1					--	<0.1
<u>Chaenactis Fremontii</u>	Fremont pincushion		--		<0.1						--
<u>Chorizanthe brevicornu</u>	Brittle spine flower		--		<0.1		<0.1				
<u>Chorizanthe rigida</u>	Rigid spiny herb	<0.1	--	0.1	<0.1		<0.1				--
<u>Cryptantha angustifolia</u>	Narrow-leaved cryptantha			<0.1	--	<0.1					
<u>Cryptantha inaequata</u>	Darwin cryptantha	<0.1									
<u>Cryptantha maritima</u>	White-haired cryptantha		<0.1				--			0.1	<0.1
<u>Cryptantha muricata</u>	None		--				--				

Table 9-19. Species composition, cover, and diversity of flora in five creosote bush (Larrea divaricata) communities during preoperational (1983-1985) and operational (1986-1990) periods at PVNGS monitoring sites (sheet 2 of 5)

Parameter		Site 1		Site 4		Site 6		Site 40		Site 42	
		Preop*	Op	Preop	Op	Preop	Op	Preop	Op	Preop	Op
Species composition and percent cover (continued)											
Herbs (continued)											
Cryptantha pterocarya	None		--								
Cryptantha sp.	None		--		<0.1		<0.1				--
Dalea mollis	Silk dalea						<0.1				--
Dalea neomexicana	Indigo bush; pea bush									0.1	<0.1
Daucus pusillus	American carrot	--	0.7								
Eriastrum diffusum	None	<0.1									
Erigeron lobatus	Fleabane		--								
Eriogonum Thomasii	Thomas eriogonum	0.1	<0.1	<0.1	0.1	--	0.1			--	0.3
Eriogonum trichopes	Little trumpet			0.1	<0.1	<0.1	<0.1		--	0.8	0.1
Eriophyllum lanosum	Woolly eriophyllum	0.1	--			<0.1	--				
Erodium cicutarium	Filaree; heron bill		0.2		<0.1		0.1		<0.1		
Erodium texanum	Large-flowered stork's bill; heron bill	0.9	0.4	0.1	<0.1	0.1	0.1			<0.1	<0.1
Euphorbia polycarpa	Small-seeded sand mat		<0.1		--	--	0.1		0.1		--
Euphorbia sp.	Spurge				--	--	--	2.0			
Filago arizonica	Arizona filago	0.1	--								
Hesperocallis undulata	Desert lily			<0.1	<0.1						
Lepidium lasiocarpum	Sand pepper grass	0.2	0.1	0.1	0.2	0.1	0.1		<0.1	0.7	0.3
Lepidium virginicum	Pepper grass; pepperwort	--	--	--	--	--	--	--		--	
Lepidium sp.	Pepper grass; pepperwort		--		--		--		--		--

Table 9-19. Species composition, cover, and diversity of flora in five creosote bush (Larrea divaricata) communities during preoperational (1983-1985) and operational (1986-1990) periods at PVNGS monitoring sites (sheet 3 of 5)

Parameter		Site 1 Preop*	Site 1 Op	Site 4 Preop	Site 4 Op	Site 6 Preop	Site 6 Op	Site 40 Preop	Site 40 Op	Site 42 Preop	Site 42 Op
Species composition and percent cover (continued)											
Herbs (continued)											
Lesquerella Gordoni	Gordon bladderpod				0.3			--	0.2		--
Linanthus bigelovii	None		<0.1				<0.1				
Linanthus dichotomus	Evening snow	0.1				<0.1					
Lotus salsuginosus	Deer vetch				--						<0.1
Lotus tomentellus	Hairy lotus					<0.1	<0.1				
Lupinus sparsiflorus	Lupine					0.1	0.1				
Machaeranthera Coulteri§	None		<0.1		--		<0.1				
Monoptilon bellioides	Mohave desert star		<0.1				<0.1		--		
Nemacladus glanduliferus	Thread plant	0.1									
Oenothera sp.	Evening primrose; sun drops						--				
Oligomeris linifolia	Linear-leaved cambess	<0.1		--	<0.1						
Orthocarpus purpurascens	Mohave owl clover		--	--	<0.1		--				<0.1
Pectis papposa	Chinchweed	--	--	--	<0.1	--	<0.1	<0.1	0.1		
Pectocarya platycarpa	Broad-nutted comb bur	0.2	<0.1	0.2	<0.1	0.1	0.2		0.1	0.2	<0.1
Perityle Emoryi	Emory rock daisy						--				
Phacelia crenulata	None	<0.1	<0.1	--	<0.1						
Pholistoma auritum	None						<0.1				
Plantago insularis	Woolly plantain; Indian wheat	1.1	1.3	3.5	4.7	0.5	3.4	8.1	2.9	0.7	1.6
Sisymbrium Irio	London rocket								--		
Spermolepis echinata	Scale seed	0.6									

Table 9-19. Species composition, cover, and diversity of flora in five creosote bush (Larrea divaricata) communities during preoperational (1983-1985) and operational (1986-1990) periods at PVNGS monitoring sites (sheet 4 of 5)

Parameter		Site 1 Preop	Site 1 Op	Site 4 Preop	Site 4 Op	Site 6 Preop	Site 6 Op	Site 40 Preop	Site 40 Op	Site 42 Preop	Site 42 Op
Species composition and percent cover (continued)											
Herbs (continued)											
Sphaeralcea Coulteri	Coulter globe mallow							16.0	0.2		
Sphaeralcea sp.	Alkali pink								<0.1		
Tidestromia lanuginosa	Woolly tidestromia				--				0.1		
Grasses											
Aristida adscensionis	Six weeks three-awn	--	<0.1		--		0.1				--
Aristida sp.	Three-awn	--									
Bouteloua barbata	Six-weeks grama	--	0.1	--	--	--	--	--	--		
Bromus rubens	Red brome; foxtail chess	--	0.2		--	--	0.6	--			
Erioneuron pulchellum	Fluff grass		--								
Festuca octoflora	Six-weeks fescue	0.4	0.2			0.4	0.1				--
Muhlenbergia microsperma	Littleseed muhly		--								
Schismus arabicus	Arabian grass		0.1	--	0.3		0.3		1.1		0.4
Schismus barbatus	Meditteranean grass	0.6	<0.1	1.8		<0.1		0.3	1.7	0.7	0.3
Schismus sp.	None		0.2		0.3		1.5		2.3		0.7
Cacti											
Echinocereus Englemannii	Hedgehog cactus; strawberry cactus				--						

Table 9-19. Species composition, cover, and diversity of flora in five creosote bush (Larrea divaricata) communities during preoperational (1983-1985) and operational (1986-1990) periods at PVNGS monitoring sites (sheet 5 of 5)

Parameter		Site 1		Site 4		Site 6		Site 40		Site 42	
		Preop*	Op	Preop	Op	Preop	Op	Preop	Op	Preop	Op
Species composition and percent cover (continued)											
Cacti (continued)											
Opuntia acanthocarpa	Buckhorn cholla			0.3	--	--				--	--
Opuntia echinocarpa	Silver cholla; golden cholla			0.1	<0.1						--
Opuntia leptocaulis	Desert Christmas cactus	--	--								
Opuntia ramosissima	Diamond cholla			0.5	0.4					--	--
Species diversity and number of plots											
Species richness		30	43	26	40	23	38	11	23	15	29
Heterogeneity (H')		.52	.48	.52	.50	.26	.50	.54	.65	.32	.34
Index of similarity (%)		63		73		62		47		64	
Plots		53	100	50	100	50	100	50	100	50	100

Key: -- (dash), species present in plot but not on transect.

*Values have been recalculated due to a previous slight error in total plot size.

†Scientific name.

‡Common name. Names have been updated using Lehr, 1978.

§Machaeranthera arida is now recognized as the same species as Machaeranthera Coulteri.

Table 9-20. Preoperational and 1990 ionic content (µg/g dry weight) of salt bush (Atriplex polycarpa) leaf tissue at PVNGS monitoring sites (means ± standard errors)

Ion	Site 2		Site 3		Site 44	
	1983-1985	1990	1983-1985	1990	1984-1985	1990
Sodium	48,721 ± 1,077 (n = 50)	64,625 ± 2,497 (n = 20)	51,417 ± 1,296 (n = 50)	67,500 ± 2,882 (n = 20)	33,564 ± 1,082 (n = 40)	40,522 ± 1,797 (n = 20)
Potassium	13,328 ± 888 (n = 50)	20,504 ± 1,146 (n = 20)	17,207 ± 969 (n = 50)	22,800 ± 1,468 (n = 20)	22,612 ± 1,324[a] (n = 40)	21,435 ± 1,549[a] (n = 20)
Calcium	11,887 ± 1,153[a] (n = 50)	11,920 ± 673[a] (n = 20)	13,333 ± 1,767[a] (n = 50)	11,941 ± 990[a] (n = 20)	9,175 ± 346[a] (n = 40)	9,561 ± 375[a] (n = 20)
Magnesium	4,359 ± 257 (n = 50)	5,538 ± 377 (n = 20)	5,721 ± 243[a] (n = 50)	5,571 ± 330[a] (n = 20)	8,038 ± 1,831[a] (n = 40)	6,696 ± 374[a] (n = 20)
Chloride	59,225 ± 4,683[a] (n = 50)	56,354 ± 2,058[a] (n = 20)	60,440 ± 3,691[a] (n = 50)	61,894 ± 2,849[a] (n = 20)	40,428 ± 2,445[a] (n = 40)	42,778 ± 2,307[a] (n = 20)
Sulfate	8,914 ± 659 (n = 50)	5,145 ± 469 (n = 20)	7,550 ± 623 (n = 50)	4,804 ± 513 (n = 18)	11,200 ± 1,072 (n = 40)	7,726 ± 675 (n = 20)
Nitrate (as N)	342 ± 49[a] (n = 44)	271 ± 33[a] (n = 20)	386 ± 55[a] (n = 45)	237 ± 23[a] (n = 20)	372 ± 54[a] (n = 33)	270 ± 22[a] (n = 20)
Phosphate (as P)	1,324 ± 183[a] (n = 50)	1,349 ± 63[a] (n = 20)	979 ± 43 (n = 50)	1,269 ± 54 (n = 20)	1,437 ± 74[a] (n = 40)	1,575 ± 65[a] (n = 20)
Fluoride	7.7 ± 0.6 (n = 30)	9.7 ± 0.3 (n = 20)	7.9 ± 0.7[a] (n = 32)	9.1 ± 0.1[a] (n = 20)	8.4 ± 0.6 (n = 30)	10.5 ± 0.3 (n = 20)

Key: For individual ions at same site, means with superscript "a" are not significantly different at 95-percent confidence level.

Table 9-21. Species composition, cover, and diversity of flora in three salt bush (Atriplex sp.) communities during preoperational (1983-1985) and operational (1986-1990) periods at PVNGS monitoring sites (sheet 1 of 4)

Parameter		Site 2		Site 3		Site 44	
		Preop	Op	Preop	Op	Preop	Op
	Species composition and percent cover						
Shrubs							
Ambrosia dumosa*	White bursage†			0.1	<0.1		
Atriplex linearis	Salt bush, narrow-leaf wingscale	0.5	0.5	1.5	1.0	0.4	
Atriplex polycarpa	Salt bush, all scale	18.9	18.9	20.0	21.4	13.1	7.8
Larrea divaricata	Cresote bush; greasewood	4.9	4.8			0.8	0.6
Lycium Fremontii	Fremont thornbush	0.1	0.2	1.3	2.7		
Lycium sp.	Wolf-berry; desert thorn	0.3	0.1	5.4	1.7		
Prosopis velutina	Velvet mesquite	3.9	5.7		--		0.6
Herbs							
Abronia villosa	Hairy sand verbena	<0.1					
Allionia incarnata	Trailing four-o'clock; windmills	--	<0.1				
Amaranthus crassipes	Amaranth; pig weed		--				
Amaranthus fimbriatus	Fringed amaranth	0.1	<0.1	<0.1	--		
Amsinckia intermedia	Coast fiddleneck	0.1	0.1	--	<0.1	<0.1	--
Boerhaavia intermedia	Five-winged ringstem		0.1				
Brassica Tournefortii	Mustard						--
Chaenactis carphoclinia	Pebble pincushion	--					
Cryptantha angustifolia	Narrow-leaved cryptantha			--			
Cryptantha inaequata	Darwin cryptantha				<0.1		
Cryptantha maritima	White-haired cryptantha				--		
Eremalche exilis	None						--
Eriastrum diffusum	None			<0.1	<0.1		

Table 9-21. Species composition, cover, and diversity of flora in three salt bush (Atriplex sp.) communities during preoperational (1983-1985) and operational (1986-1990) periods at PVNGS monitoring sites (sheet 2 of 4)

Parameter		Site 2 Preop	Site 2 Op	Site 3 Preop	Site 3 Op	Site 44 Preop	Site 44 Op
Species composition and percent cover (continued)							
Herbs (continued)							
Erigeron lobatus	Fleabane		--				
Eriogonum Thomasii	Thomas eriogonum	--					
Eriogonum trichopes	Little trumpet						--
Eriophyllum lanosum	Woolly eriophyllum	0.2	<0.1	<0.1	<0.1		
Erodium cicutarium	Filaree; heron bill				--		
Erodium texanum	Large-flowered stork's bill; heron bill		--				
Eucrypta micrantha	Small-flowered eucrypta					<0.1	
Euphorbia capitellata	Spurge	--					
Euphorbia polycarpa	Small-seeded sand mat		1.3		0.3		0.1
Euphorbia sp.	Spurge	<0.1	--	0.3	--	6.2	
Lepidium lasiocarpum	Sand pepper grass	<0.1	<0.1	0.1	<0.1	<0.1	<0.1
Lepidium virginicum	Pepper grass; pepperwort	--		--		--	
Lepidium sp.	Pepper grass; pepperwort		--		--		
Lesquerella Gordoni	Gordon bladderpod	--					
Machaeranthera Coulteri‡	None	<0.1	<0.1	<0.1	<0.1		
Monoptilon bellioides	Mohave desert star		--		--		
Nama demissum	Purple mat		--		--		
Nama hispidum	None			<0.1			
Oligomeris linifolia	Linear-leaved cambess	--	<0.1	--	<0.1		
Orthocarpus purpurascens	Mohave owl clover	--				--	
Pectis papposa	Chinchweed	0.1	0.1	0.2	0.3	0.3	<0.1
Pectocarya platycarpa	Broad-nutted comb bur		--	--	<0.1		--
Phacelia crenulata	None				--		

Table 9-21. Species composition, cover, and diversity of flora in three salt bush (Atriplex sp.) communities during preoperational (1983-1985) and operational (1986-1990) periods at PVNGS monitoring sites (sheet 3 of 4)

Parameter		Site 2		Site 3		Site 44	
		Preop	Op	Preop	Op	Preop	Op
Species composition and percent cover (continued)							
Herbs (continued)							
Plantago insularis	Woolly plantain; Indian wheat	1.1	1.2	0.3	0.4	2.5	0.5
Portulaca parvula	Purslane		--		--		
Proboscidea altheaefolia	Desert unicorn plant; elephant tusks	0.1					
Salsola Kali	Russian thistle				--		
Sisymbrium Irio	London rocket		--		--		
Sphaeralcea Coulteri	Coulter globe mallow	1.8	<0.1	<0.1	<0.1	7.2	0.1
Sphaeralcea sp.	Alkali pink		0.1		--		<0.1
Tidestromia lanuginosa	Woolly tidestromia		--			--	<0.1
Trianthema Portulacastrum	Horse purslane	<0.1			<0.1		
Grasses							
Bouteloua barbata	Six-weeks gamma	0.3	0.1	0.9	0.2		
Festuca octoflora	Six-weeks fescue	--		0.1			
Schismus arabicus	Arabian grass		1.9		2.3		2.9
Schismus barbatus	Meditteranean grass	2.1	0.1	6.8	0.7	7.2	0.9
Schismus sp.	None		3.6		3.9		6.3

Table 9-21. Species composition, cover, and diversity of flora in three salt bush (Atriplex sp.) communities during preoperational (1983-1985) and operational (1986-1990) periods at PVNGS monitoring sites (sheet 4 of 4)

Parameter	Site 2		Site 3		Site 44	
	Preop	Op	Preop	Op	Preop	Op
Species diversity and number of plots						
Species richness	29	34	23	35	14	18
Heterogeneity (H')	.67	.74	.62	.62	.72	.66
Index of similarity (%)	60		66		56	
Plots	50	100	50	100	50	100

Key: -- (dash), species present in plot but not on transect.

*Scientific name.

†Common name. Names have been updated using Lehr, 1978.

‡Since Machaeranthera arida and Machaeranthera Coulteri are now recognized as one species, all data have been combined.

Table 9-22. Electrical conductivity and concentrations of soluble ions in soils at PVNGS agricultural monitoring sites, preoperational period and 1990 (means ± standard errors)

Parameter	Preoperational* (n = 404)	1990 (n = 156)
Electrical conductivity (mmhos/cm)	1.40 ± 0.06	1.36 ± 0.06
Soluble ions (ppm)		
Calcium	48 ± 3	50 ± 3
Magnesium	7.0 ± 0.4	7.8 ± 0.6
Sodium	266 ± 10	250 ± 10
Potassium	26 ± 1	22 ± 2
Chloride	173 ± 12	180 ± 14

*May 1983 through December 1985.

Note: For all values, none of the means for the preoperational period and 1990 are significantly different at 95-percent confidence level.

Table 9-23. Electrical conductivity and ion content of soil at PVNGS agricultural monitoring sites, preoperational period and 1990 (means ± standard errors)

Site†	Electrical conductivity (mmhos/cm)		Soluble calcium (ppm)		Soluble magnesium (ppm)	
	Preoperational*	1990	Preoperational*	1990	Preoperational*	1990
7	1.17 ± 0.14[a]	0.71 ± 0.05[a]	31 ± 2	28 ± 1	6.0 ± 0.5[a]	4.7 ± 0.3[a]
11	1.35 ± 0.12	1.75 ± 0.13	44 ± 4	43 ± 2	3.7 ± 0.3[a]	4.7 ± 0.2[a]
12	1.89 ± 0.20[a]	2.84 ± 0.17[a]	63 ± 8[a]	112 ± 13[a]	9.6 ± 1.4	11 ± 1
13	0.96 ± 0.07	0.89 ± 0.05	21 ± 2[a]	34 ± 2[a]	2.8 ± 0.2[a]	5.2 ± 0.5[a]
23	1.27 ± 0.12	1.66 ± 0.28	56 ± 7	75 ± 16	6.2 ± 0.7	9.0 ± 2.2
24	0.89 ± 0.04	0.96 ± 0.06	31 ± 2	35 ± 2	4.0 ± 0.4	4.8 ± 0.3
25	0.98 ± 0.07[a]	1.72 ± 0.14[a]	66 ± 8[a]	138 ± 14[a]	9.0 ± 0.8[a]	26 ± 3[a]
28	0.71 ± 0.04	0.63 ± 0.04	20 ± 2[a]	25 ± 1[a]	2.3 ± 0.3	3.1 ± 0.3
30	3.82 ± 0.30[a]	1.52 ± 0.10[a]	157 ± 17[a]	41 ± 2[a]	22 ± 2[a]	6.3 ± 0.5[a]
31	0.87 ± 0.05[a]	1.35 ± 0.09[a]	19 ± 2[a]	26 ± 1[a]	3.9 ± 0.9	4.3 ± 0.8
32	1.26 ± 0.09	1.09 ± 0.12	26 ± 7	21 ± 1	2.8 ± 0.4	4.6 ± 1.1
43	1.65 ± 0.22	1.63 ± 0.12	66 ± 9	58 ± 3	14 ± 2	14 ± 1
45	1.31 ± 0.11[a]	0.93 ± 0.06[a]	17 ± 2	19 ± 1	3.3 ± 0.7	4.3 ± 0.8

Site†	Soluble sodium (ppm)		Soluble potassium (ppm)		Chloride (ppm)	
	Preoperational*	1990	Preoperational*	1990	Preoperational*	1990
7	231 ± 30[a]	133 ± 12[a]	11 ± 1	12 ± 2	103 ± 28	47 ± 9
11	235 ± 19[a]	345 ± 28[a]	32 ± 3	32 ± 1	153 ± 21[a]	269 ± 27[a]
12	361 ± 43	467 ± 43	80 ± 8	79 ± 3	299 ± 46[a]	593 ± 53[a]
13	197 ± 21	164 ± 10	17 ± 1	21 ± 3	120 ± 16	99 ± 11
23	254 ± 26	329 ± 49	18 ± 1	13 ± 2	153 ± 28	275 ± 69
24	166 ± 9	173 ± 14	34 ± 2	27 ± 3	65 ± 8	87 ± 11
25	124 ± 9	155 ± 14	28 ± 2	32 ± 3	59 ± 9[a]	139 ± 19[a]
28	148 ± 8	136 ± 12	9.4 ± 0.7	9.8 ± 1.4	35 ± 4	40 ± 9
30	694 ± 51[a]	297 ± 25[a]	52 ± 5[a]	11 ± 1[a]	696 ± 63[a]	235 ± 24[a]
31	189 ± 11[a]	285 ± 24[a]	7.9 ± 0.6	9.7 ± 1.5	79 ± 11[a]	158 ± 22[a]
32	294 ± 24	252 ± 26	4.3 ± 0.4	18 ± 7	124 ± 17	103 ± 20
43	289 ± 35	288 ± 24	28 ± 3[a]	13 ± 1[a]	241 ± 38	254 ± 32
45	295 ± 23[a]	232 ± 16[a]	6.8 ± 1.6	7.5 ± 1.6	99 ± 19[a]	42 ± 9[a]

Key: For individual parameters at each site, means with superscript "a" are significantly different at 95-percent confidence level.

*May 1983 through December 1985.

†Number of samples was 12 for each site in 1990; it was 32 for all sites except site 45 (n = 20) in preoperational period.

Table 9-24. Electrical conductivity and concentrations of soluble ions in soils at PVNGS native monitoring sites, preoperational period and 1990 (means ± standard errors)

Parameter	Preoperational (n = 576)	1990 (n = 232)
Electrical conductivity (mmhos/cm)	0.59 ± 0.03	0.68 ± 0.05
Soluble ions (ppm)		
Calcium†	44 ± 2	56 ± 6
Magnesium	5.1 ± 0.3	5.9 ± 0.4
Sodium†	70 ± 5	90 ± 8
Potassium	22 ± 1	23 ± 2
Chloride†	50 ± 6	82 ± 10

†Means for preoperational period and 1990 are significantly different at 95-percent confidence level.

Notes:
1. Preoperational period is defined as May 1983 through December 1985 for all sites except sites 16 and 20, for which it is May 1983 through December 1984.
2. Measurements for sites 3 and 16 are not included in calculations.

Table 9-25. Electrical conductivity and ion content of soil at PVNGS native monitoring sites, preoperational period and 1990 (means ± standard errors) (sheet 1 of 2)

Site	Electrical conductivity (mmhos/cm)		Soluble calcium (ppm)		Soluble magnesium (ppm)	
	Preoperational	1990	Preoperational	1990	Preoperational	1990
1	1.05 ± 0.16	2.51 ± 0.82	110 ± 18	363 ± 128	8.1 ± 1.0	21 ± 7
2	0.78 ± 0.22	0.71 ± 0.17	35 ± 6	31 ± 3	10 ± 5	4.9 ± 0.4
3	5.57 ± 1.15	7.18 ± 1.44	45 ± 8	77 ± 20	18 ± 6	11 ± 3
4	0.35 ± 0.02	0.41 ± 0.05	50 ± 3	60 ± 4	4.2 ± 0.3	4.8 ± 0.4
5	0.58 ± 0.03	0.61 ± 0.06	21 ± 2[a]	35 ± 4[a]	3.2 ± 0.3	4.1 ± 0.4
6	0.35 ± 0.02	0.70 ± 0.32	35 ± 3[a]	51 ± 5[a]	3.2 ± 0.3	4.0 ± 0.2
8	0.91 ± 0.17	1.06 ± 0.24	21 ± 2	27 ± 2	3.5 ± 0.3	4.4 ± 0.3
9	0.50 ± 0.04	0.47 ± 0.05	53 ± 6	48 ± 2	7.3 ± 0.4	7.8 ± 0.5
10	0.40 ± 0.03	0.36 ± 0.04	45 ± 6	51 ± 2	6.1 ± 0.6	5.4 ± 0.3
14	1.21 ± 0.31	1.22 ± 0.20	45 ± 6	70 ± 15	7.0 ± 0.5	12 ± 3
15	0.38 ± 0.03[a]	0.31 ± 0.01[a]	55 ± 5	51 ± 2	4.4 ± 0.3	4.8 ± 0.2
16	4.80 ± 1.12	7.16 ± 1.49	29 ± 3[a]	62 ± 8[a]	4.6 ± 0.5[a]	9.8 ± 1.7[a]
17	0.49 ± 0.05	0.58 ± 0.04	54 ± 5[a]	79 ± 5[a]	7.6 ± 1.6[a]	15 ± 2[a]
18	0.33 ± 0.02	0.31 ± 0.01	48 ± 3[a]	57 ± 2[a]	4.2 ± 0.3	4.8 ± 0.2
19	0.42 ± 0.02[a]	0.53 ± 0.04[a]	37 ± 2[a]	47 ± 3[a]	4.2 ± 0.2[a]	6.8 ± 0.5[a]
20	0.47 ± 0.03	0.56 ± 0.04	33 ± 8	26 ± 1	13 ± 5	5.3 ± 0.4
21	0.58 ± 0.08	0.74 ± 0.17	20 ± 2	23 ± 2	4.3 ± 0.6	4.9 ± 0.4
22	0.27 ± 0.02	0.24 ± 0.01	41 ± 2	46 ± 1	3.2 ± 0.2	4.0 ± 0.2
26	0.31 ± 0.02	0.34 ± 0.03	52 ± 7	45 ± 2	3.6 ± 0.2	4.0 ± 0.2
27	1.43 ± 0.27	1.36 ± 0.35	28 ± 3	30 ± 2	5.4 ± 1.2	6.3 ± 1.3
33	0.21 ± 0.02[a]	0.18 ± 0.00[a]	28 ± 2[a]	34 ± 2[a]	2.8 ± 0.2[a]	3.5 ± 0.2[a]
34	0.31 ± 0.02	0.30 ± 0.02	45 ± 3	49 ± 3	3.6 ± 0.2	3.9 ± 0.3
35	0.21 ± 0.02	0.20 ± 0.01	31 ± 2[a]	38 ± 2[a]	2.8 ± 0.1[a]	3.0 ± 0.0[a]
36	0.57 ± 0.14	0.49 ± 0.10	53 ± 8	54 ± 6	4.4 ± 0.6	4.5 ± 0.5
37	0.31 ± 0.02	0.28 ± 0.01	56 ± 4	58 ± 2	3.8 ± 0.2	3.8 ± 0.2
38	0.58 ± 0.05[a]	0.83 ± 0.12[a]	15 ± 4	18 ± 2	2.7 ± 0.5	4.0 ± 0.7
39	1.68 ± 0.36	1.45 ± 0.31	69 ± 25	29 ± 3	8.0 ± 2.9	4.1 ± 0.5
40	0.37 ± 0.02	0.45 ± 0.05	56 ± 2	57 ± 5	4.5 ± 0.2	5.9 ± 0.6
41	1.00 ± 0.21	1.56 ± 0.29	43 ± 8	50 ± 11	4.4 ± 0.3	5.1 ± 1.1
42	0.29 ± 0.02	0.31 ± 0.02	46 ± 2[a]	58 ± 2[a]	3.3 ± 0.2[a]	4.1 ± 0.1[a]
44	0.65 ± 0.06	0.75 ± 0.16	44 ± 14	36 ± 3	4.9 ± 0.5	6.3 ± 0.6

Table 9-25. Electrical conductivity and ion content of soil at PVNGS native monitoring sites, preoperational period and 1990 (means ± standard errors) (sheet 2 of 2)

Site	Soluble sodium (ppm)		Soluble potassium (ppm)		Chloride (ppm)	
	Preoperational	1990	Preoperational	1990	Preoperational	1990
1	91 ± 17	166 ± 45	12 ± 1	12 ± 2	108 ± 26	398 ± 160
2	92 ± 20	132 ± 41	23 ± 3	21 ± 2	44 ± 14	91 ± 42
3	1111 ± 167	1833 ± 388	32 ± 5	32 ± 3	1164 ± 210	1864 ± 358
4	10 ± 1	22 ± 5	16 ± 1	13 ± 1	8.7 ± 1.0	35 ± 18
5	104 ± 11	117 ± 19	15 ± 1	16 ± 3	21 ± 5	50 ± 15
6	40 ± 4	108 ± 63	4.4 ± 0.5	5.0 ± 0.9	12 ± 4	97 ± 74
8	174 ± 35	210 ± 60	26 ± 11	16 ± 2	148 ± 38	203 ± 58
9	35 ± 7	35 ± 6	40 ± 3	35 ± 3	31 ± 7	33 ± 12
10	30 ± 4	25 ± 5	14 ± 1	11 ± 1	15 ± 3	27 ± 6
14	63 ± 7[a]	111 ± 17[a]	93 ± 6	117 ± 20	38 ± 11	102 ± 36
15	9.6 ± 0.9	8.3 ± 1.0	25 ± 3[a]	15 ± 1[a]	12 ± 2	14 ± 1
16	1075 ± 192	1873 ± 419	59 ± 8	69 ± 10	1048 ± 205	1670 ± 332
17	11 ± 1	15 ± 3	50 ± 8[a]	78 ± 8[a]	12 ± 1[a]	16 ± 2[a]
18	13 ± 1	17 ± 1	9.6 ± 0.9	7.3 ± 1.3	11 ± 1[a]	16 ± 1[a]
19	23 ± 4	30 ± 5	53 ± 2[a]	75 ± 8[a]	12 ± 1[a]	17 ± 2[a]
20	86 ± 8	106 ± 13	33 ± 3	30 ± 2	9.3 ± 0.8[a]	20 ± 2[a]
21	102 ± 18	152 ± 43	20 ± 1	24 ± 2	52 ± 15	106 ± 37
22	8.1 ± 0.7	13 ± 2	9.2 ± 0.8	6.8 ± 0.8[a]	9.5 ± 1.9	14 ± 1
26	16 ± 1	30 ± 11	8.4 ± 0.8[a]	4.3 ± 0.6[a]	10 ± 1[a]	25 ± 4[a]
27	317 ± 54	300 ± 72	15 ± 1	16 ± 2	148 ± 49	149 ± 57
33	8.9 ± 2.7	6.5 ± 0.3	10 ± 1	8.5 ± 0.8	12 ± 4	13 ± 1
34	12 ± 1	14 ± 5	7.1 ± 0.4	8.3 ± 1.1	9.2 ± 1.1[a]	25 ± 5[a]
35	7.1 ± 0.4[a]	5.3 ± 0.4[a]	11 ± 1	10 ± 2	7.2 ± 1.0[a]	13 ± 2[a]
36	56 ± 18	53 ± 19	11 ± 1	9 ± 1	54 ± 24	57 ± 18
37	7.9 ± 0.8	8.5 ± 1.1	6.5 ± 0.7	4.8 ± 1.0	9.8 ± 1.8	13 ± 1
38	137 ± 16	187 ± 27	3.3 ± 0.2	3.5 ± 0.5	33 ± 8	60 ± 15
39	304 ± 58	292 ± 69	9.8 ± 1.3	6.5 ± 0.5	370 ± 104	292 ± 79
40	12 ± 1[a]	34 ± 4[a]	24 ± 1	21 ± 4	12 ± 1[a]	22 ± 4[a]
41	179 ± 45	292 ± 68	12 ± 1	10 ± 2	177 ± 51[a]	376 ± 82[a]
42	11 ± 1[a]	17 ± 2[a]	7.4 ± 0.4	8.0 ± 1.4	8.8 ± 1.5[a]	20 ± 2[a]
44	74 ± 15	106 ± 41	76 ± 5	75 ± 10	44 ± 11	90 ± 31

Key: For individual ions at each site, means with superscript "a" are significantly different at 95-percent confidence level.

*Significant difference cannot be determined because there is no variance associated with one mean.

Notes:

1. Preoperational period is defined as May 1983 through December 1985 except for sites 16 and 20, for which it is May 1983 through December 1984.
2. Number of samples was 8 for each site in 1990; it was 20 for all sites except site 44 (n = 16) in preoperational period.

Table 9-26. Deposition, soil, and crop comparison, preoperational period (May 1983 through December 1985) and 1990

Site	Sodium			Calcium			Potassium			Magnesium		
	Deposition	Soil	Crop	Deposition	Soil	Crop	Deposition	Soil	Crop	Deposition	Soil	Crop
7	NC	D	F	NC	NC	F	D	NC	F	NC	D	F
11	NC	I	I	NC	NC	I	D	NC	I	NC	I	I
12	D	NC	F	NC	I	F	NC	NC	F	I	NC	F
13	NC	NC	NC	I	I	I	NC	NC	NC	I	I	NC
23	I	NC	I	I	NC	I	I	NC	NC	I	NC	I
24	NC	NC	F	NC	NC	F	D	NC	F	NC	NC	F
25	D	NC	F	D	I	F	D	NC	F	D	I	F
28	NC	NC	F	NC	I	F	D	NC	F	NC	NC	F
30	NC	D	D	NC	D	I	NC	D	I	NC	D	I
31	NC	I	F	NC	I	F	D	NC	F	NC	NC	F
32	NC	NC	F	I	NC	F	NC	NC	F	I	NC	F
43	NC	NC	NC	NC	NC	I	D	D	NC	NC	NC	NC
45	D	D	F	NC	NC	F	D	NC	F	NC	NC	F

Key: NC, no significant change from preoperational period; F, fallow, no sample; D, decrease; I, increase.

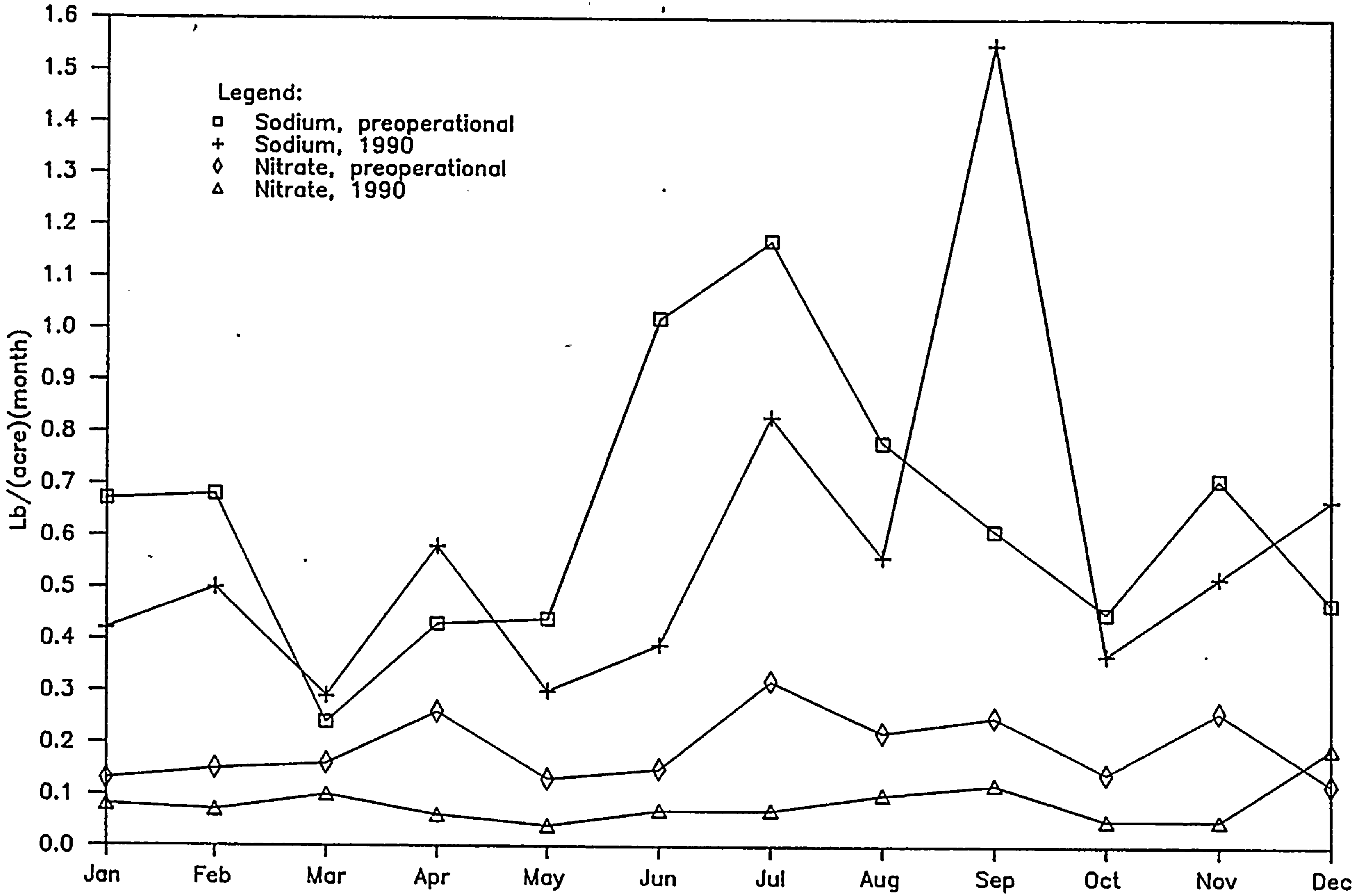

Figure 9–1. Mean monthly deposition of sodium and nitrate at PVNGS agricultural monitoring sites, preoperational period and 1990

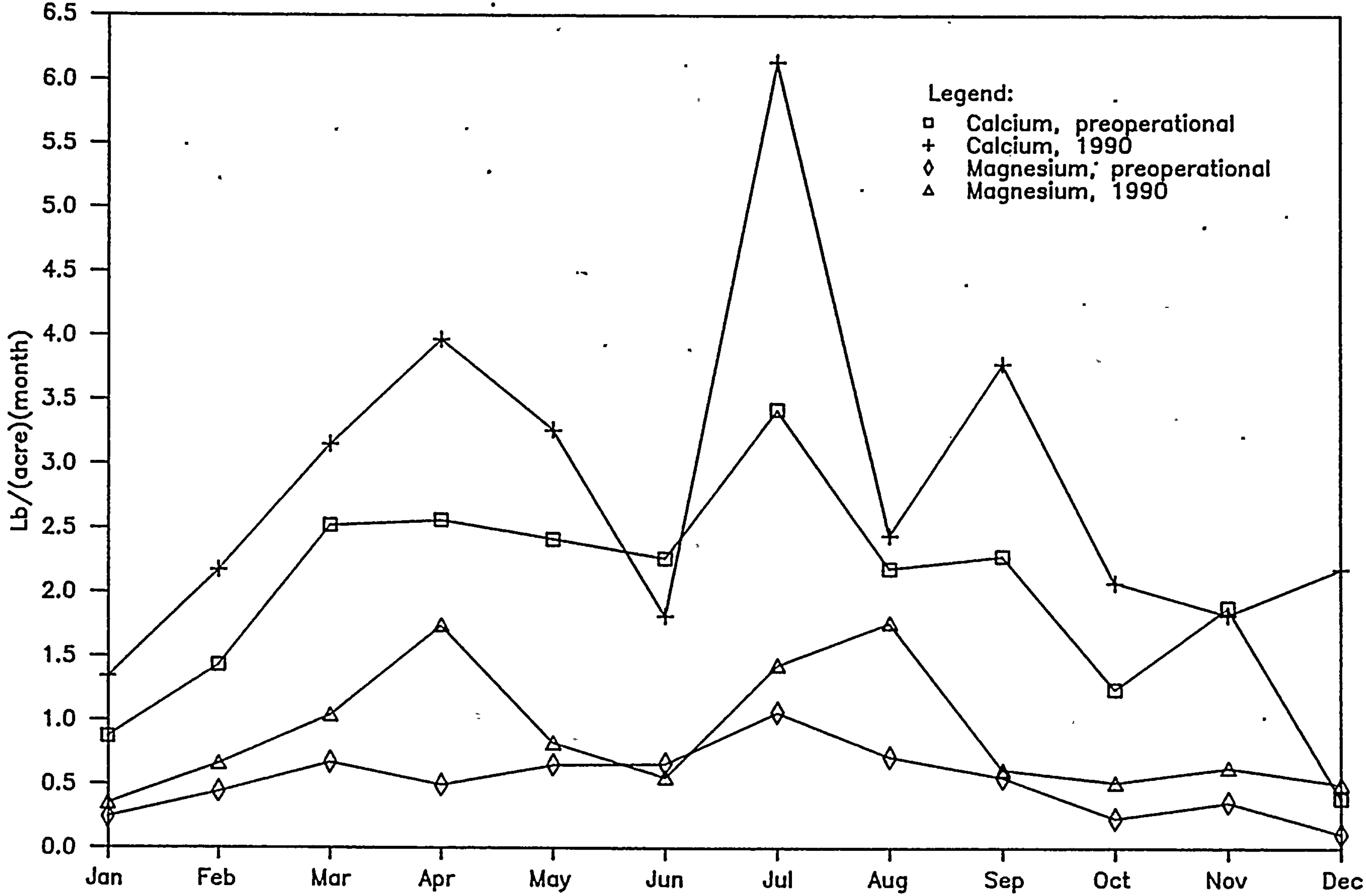

Figure 9–2. Mean monthly deposition of calcium and magnesium at PVNGS agricultural monitoring sites, preoperational period and 1990

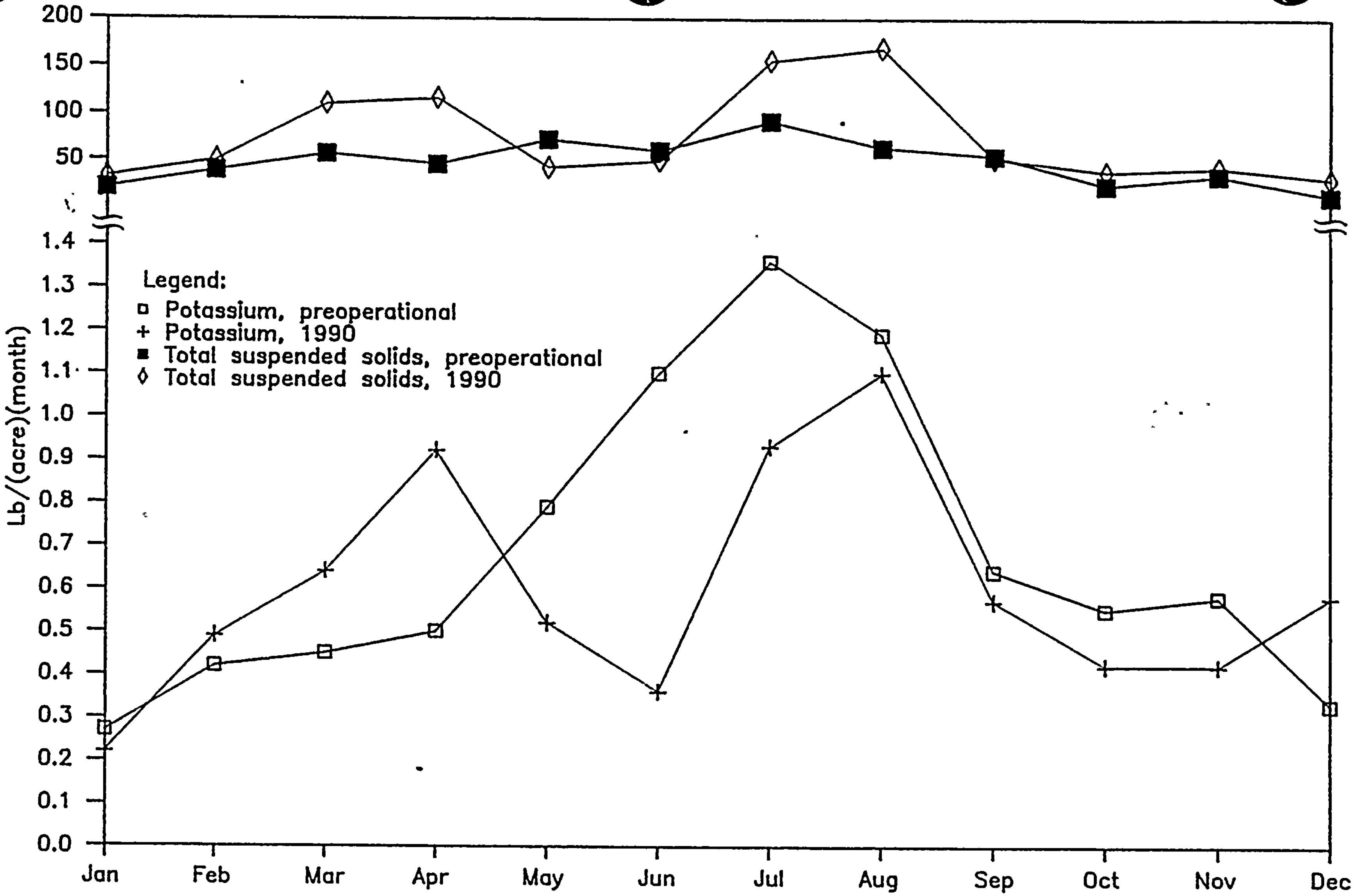

Figure 9–3. Mean monthly deposition of potassium and total suspended solids at PVNGS agricultural monitoring sites, preoperational period and 1990

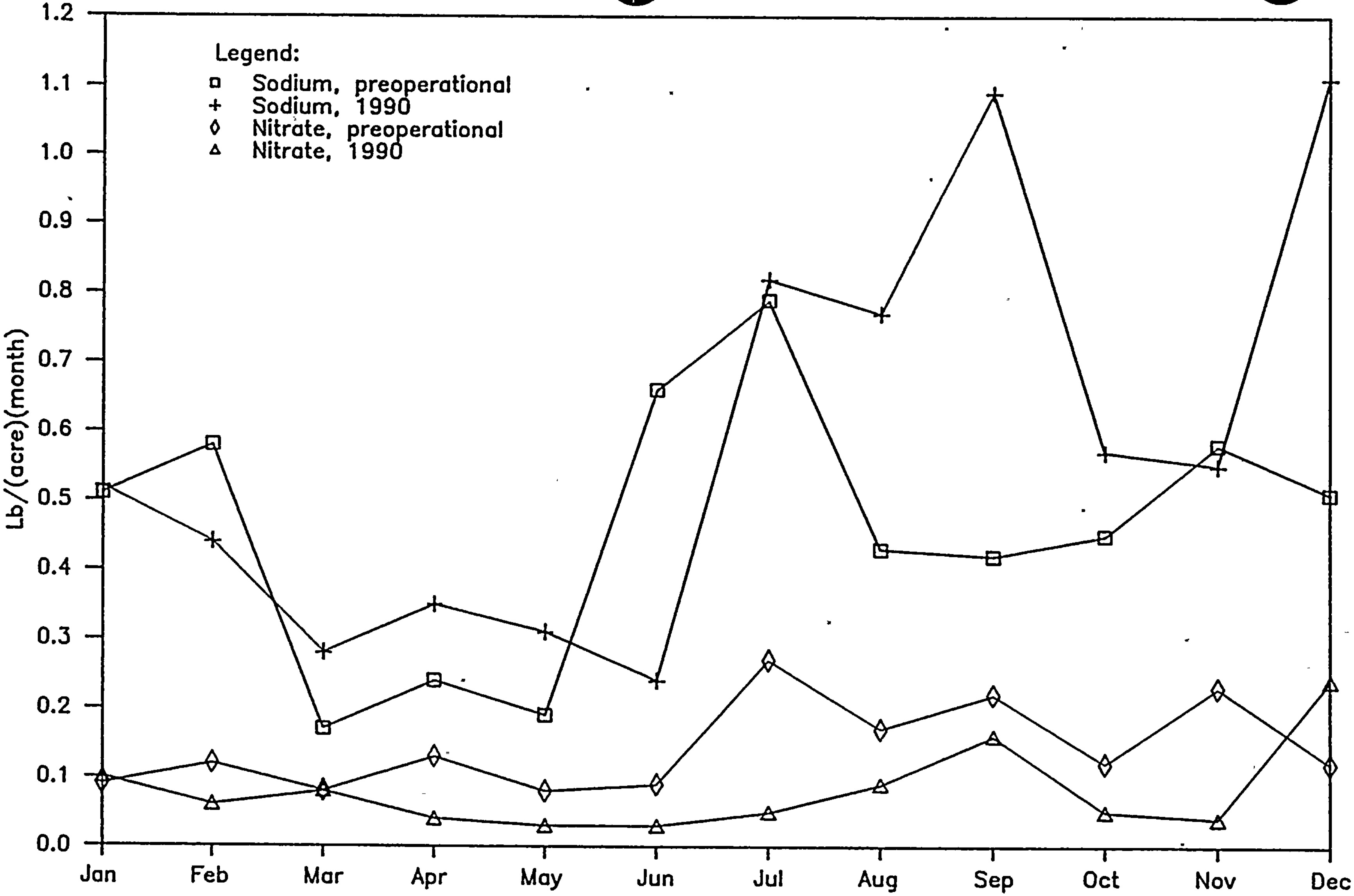

Figure 9–4. Mean monthly deposition of sodium and nitrate at PVNGS native monitoring sites (including sites 80–83), preoperational period and 1990

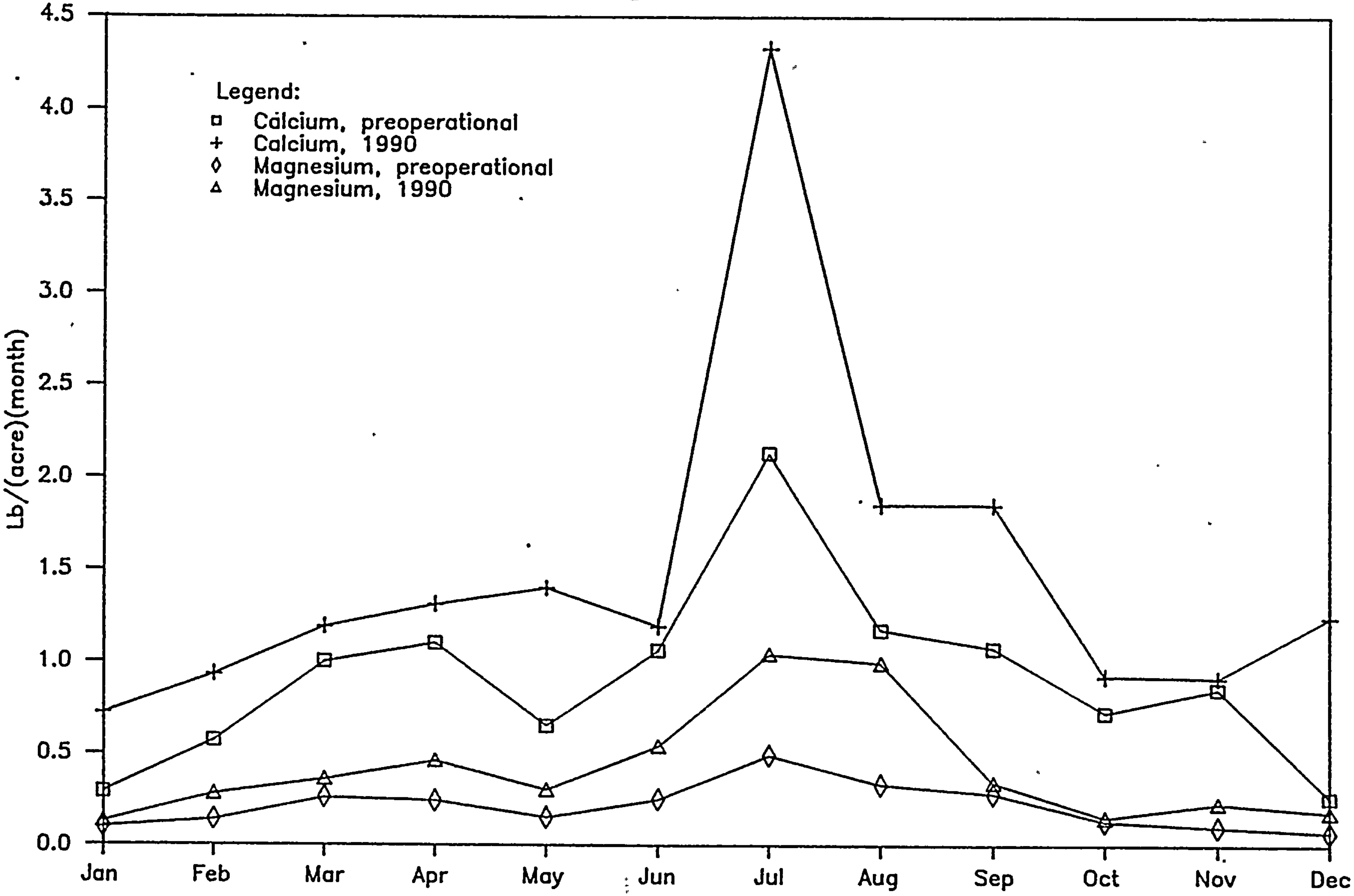

Figure 9–5. Mean monthly deposition of calcium and magnesium at PVNGS native monitoring sites (including sites 80–83), preoperational period and 1990

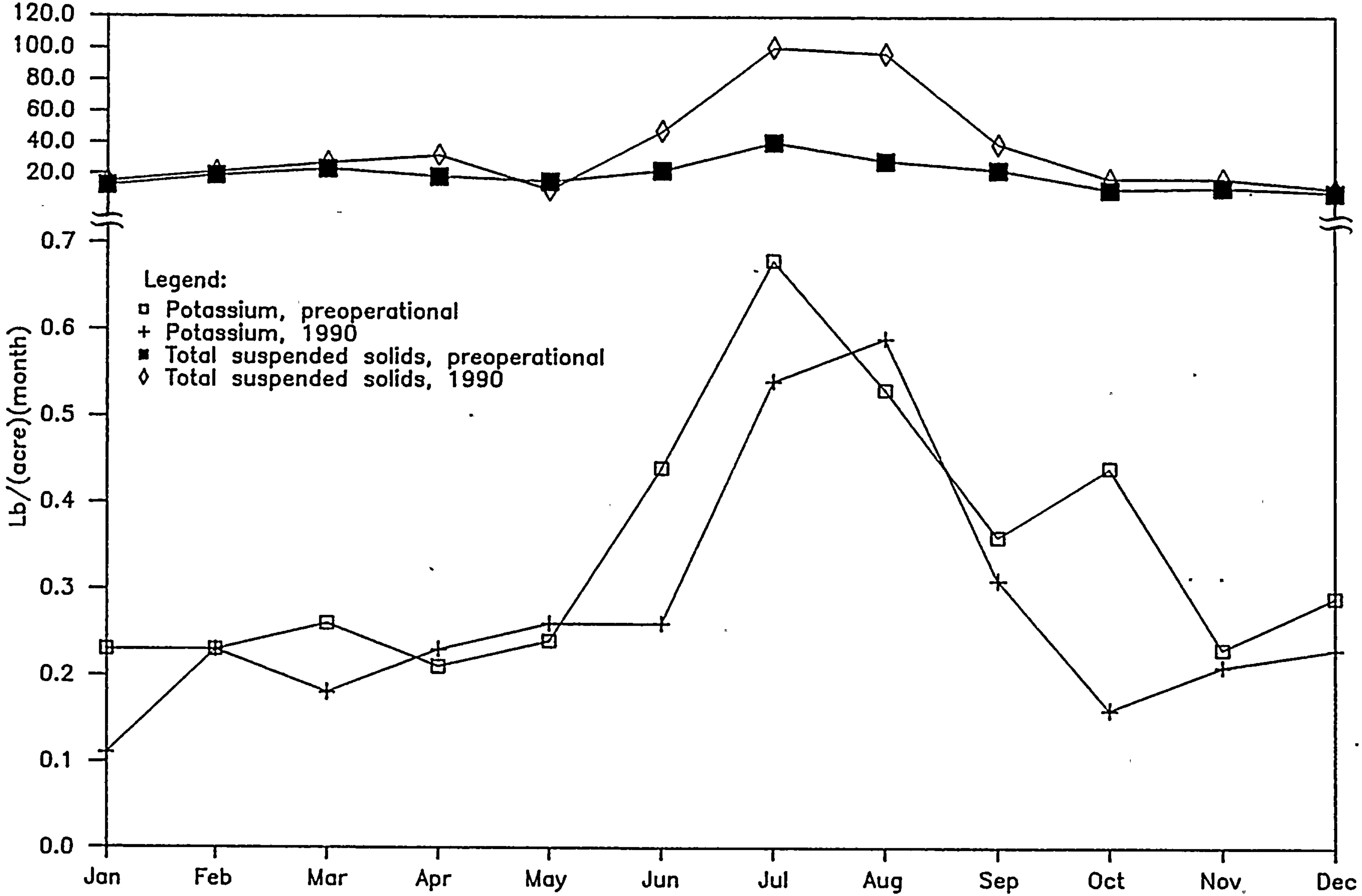

Figure 9–6. Mean monthly deposition of potassium and total suspended solids at PVNGS native monitoring sites (including sites 80–83), preoperational period and 1990

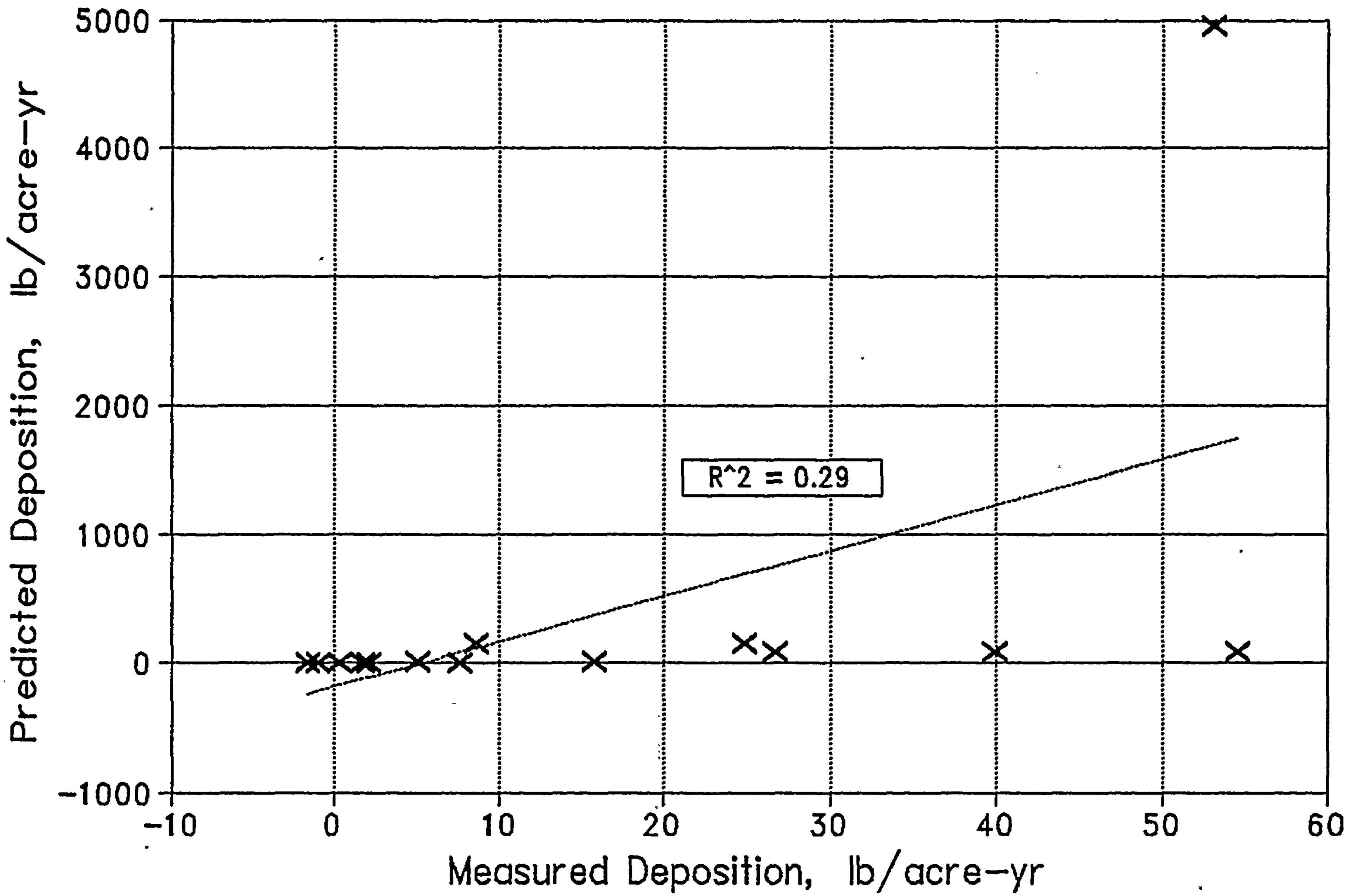

Figure 9-7. Linear regression of predicted versus measured deposition for all onsite locations at PVNGS for 1990

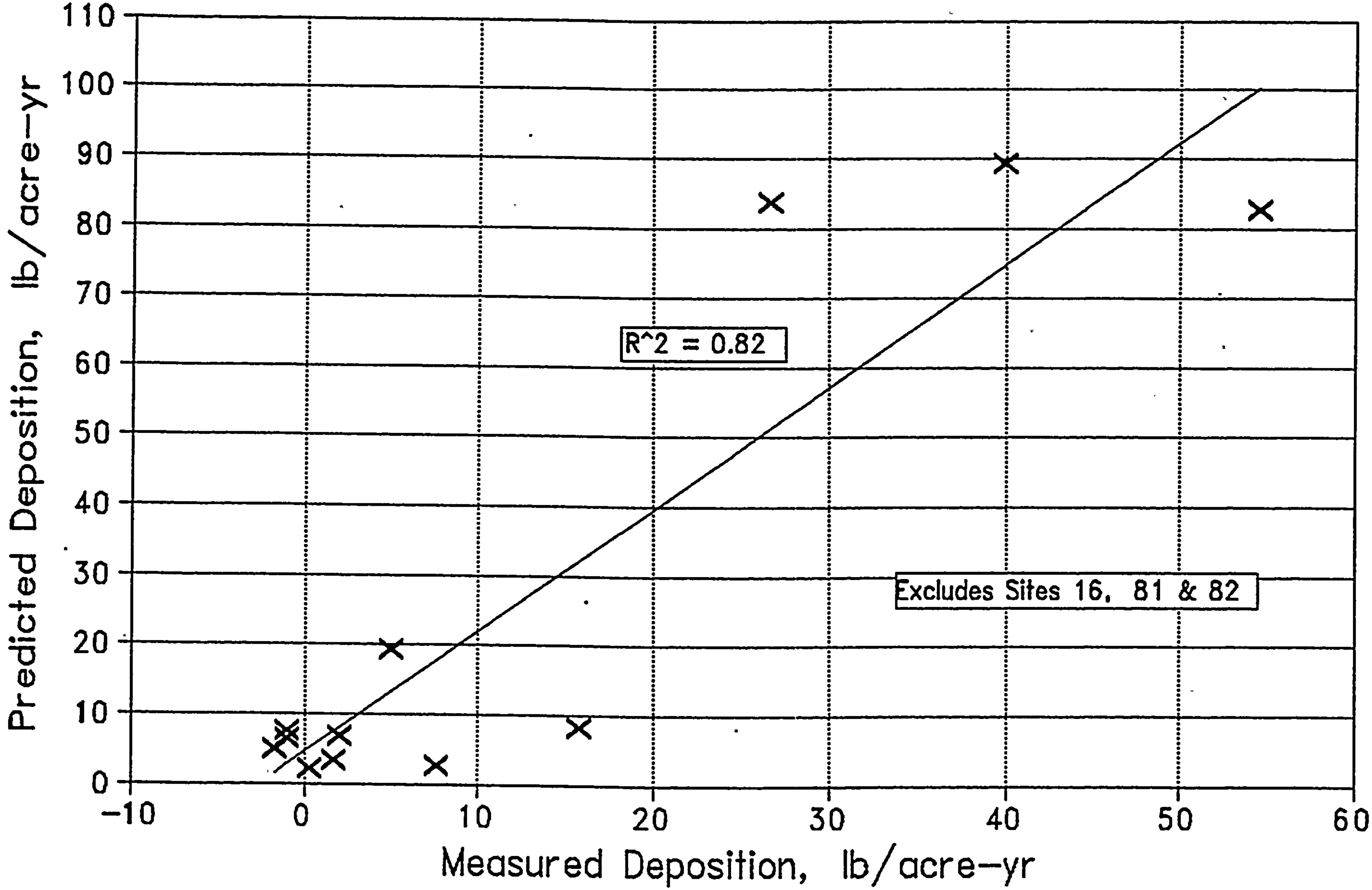

Figure 9-8. Linear regression of predicted versus measured deposition for all onsite locations except sites 16, 81 and 82 at PVNGS for 1990

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Appendix A
Plant Operating Data

Presented in this appendix are daily plant operating data which were used by the FOG code as input for the calculation of predicted drift deposition from the cooling towers for PVNGS Units 1-3. Specifically provided are circulating water conductivity data, circulating water thermal data, circulating water flowrate data (number of pumps operated per shift), total number of fans operated per shift for each of the three cooling towers, and calculated tower parameters.

COOLING TOWER SOURCE TERM
FOR 1990
INPUT DATA - UNIT 1

JANUARY	DAY	CW CONDUCTIVITY DATA umhos/cm	THERMAL GEN MWt/d	CW FLOW - No PUMPS/SHIFT Mids	Days	Swings	SUM - FANS OPER IN EA SHIFT Twr 01	Twr 02	Twr 03
	1	0	0	0	0	0	0	0	0
	2	0	0	0	0	0	0	0	0
	3	0	0	0	0	0	0	0	0
	4	0	0	0	0	0	0	0	0
	5	0	0	0	0	0	0	0	0
	6	0	0	0	0	0	0	0	0
	7	0	0	0	0	0	0	0	0
	8	0	0	0	0	0	0	0	0
	9	0	0	0	0	0	0	0	0
	10	0	0	0	0	0	0	0	0
	11	0	0	0	0	0	0	0	0
	12	0	0	0	0	0	0	0	0
	13	0	0	0	0	0	0	0	0
	14	0	0	0	0	0	0	0	0
	15	0	0	0	0	0	0	0	0
	16	0	0	0	0	0	0	0	0
	17	0	0	0	0	0	0	0	0
	18	0	0	0	0	0	0	0	0
	19	0	0	0	0	0	0	0	0
	20	0	0	0	0	0	0	0	0
	21	0	0	0	0	0	0	0	0
	22	0	0	0	0	0	0	0	0
	23	0	0	0	0	0	0	0	0
	24	0	0	0	0	0	0	0	0
	25	0	0	0	0	0	0	0	0
	26	0	0	0	0	0	0	0	0
	27	0	0	0	0	0	0	0	0
	28	0	0	0	0	0	0	0	0
	29	0	0	0	0	0	0	0	0
	30	0	0	0	0	0	0	0	0
	31	0	0	0	0	0	0	0	0
AVERAGE		0	0	0	0	0	0	0	0

ASSUMPTIONS: Drift Rate = 0.00075%
TDS ppm = 0.77 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE-TERM
FOR 1990
CALCULATED TOWER PERFORMANCE PARAMETERS - UNIT 1

JANUARY	DAY	Airflow /Tower. cu m/s Twr 01	Twr 02	Twr 03	Heat BTU/min	Calc TDS, ppm	CW Flow gpm	Calc Drift gpm	lb/min
	1	0	0	0	0.00E+00	0	29,000	0.000	0.000
	2	0	0	0	0.00E+00	0	29,000	0.000	0.000
	3	0	0	0	0.00E+00	0	29,000	0.000	0.000
	4	0	0	0	0.00E+00	0	29,000	0.000	0.000
	5	0	0	0	0.00E+00	0	29,000	0.000	0.000
	6	0	0	0	0.00E+00	0	29,000	0.000	0.000
	7	0	0	0	0.00E+00	0	29,000	0.000	0.000
	8	0	0	0	0.00E+00	0	29,000	0.000	0.000
	9	0	0	0	0.00E+00	0	29,000	0.000	0.000
	10	0	0	0	0.00E+00	0	29,000	0.000	0.000
	11	0	0	0	0.00E+00	0	29,000	0.000	0.000
	12	0	0	0	0.00E+00	0	29,000	0.000	0.000
	13	0	0	0	0.00E+00	0	29,000	0.000	0.000
	14	0	0	0	0.00E+00	0	29,000	0.000	0.000
	15	0	0	0	0.00E+00	0	29,000	0.000	0.000
	16	0	0	0	0.00E+00	0	29,000	0.000	0.000
	17	0	0	0	0.00E+00	0	29,000	0.000	0.000
	18	0	0	0	0.00E+00	0	29,000	0.000	0.000
	19	0	0	0	0.00E+00	0	29,000	0.000	0.000
	20	0	0	0	0.00E+00	0	29,000	0.000	0.000
	21	0	0	0	0.00E+00	0	29,000	0.000	0.000
	22	0	0	0	0.00E+00	0	29,000	0.000	0.000
	23	0	0	0	0.00E+00	0	29,000	0.000	0.000
	24	0	0	0	0.00E+00	0	29,000	0.000	0.000
	25	0	0	0	0.00E+00	0	29,000	0.000	0.000
	26	0	0	0	0.00E+00	0	29,000	0.000	0.000
	27	0	0	0	0.00E+00	0	29,000	0.000	0.000
	28	0	0	0	0.00E+00	0	29,000	0.000	0.000
	29	0	0	0	0.00E+00	0	29,000	0.000	0.000
	30	0	0	0	0.00E+00	0	29,000	0.000	0.000
	31	0	0	0	0.00E+00	0	29,000	0.000	0.000
AVERAGE		0	0	0	0.00E+00	0	29,000	0.000	0.000

ASSUMPTIONS: Drift Rate = 0.00075%
TDS ppm = 0.77 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1990
INPUT DATA - UNIT 1

FEBRUARY DAY	CW CONDUCTIVITY DATA umhos/cm	THERMAL GEN MWt/d	CW FLOW - No PUMPS/SHIFT Mids	Days	Swings	SUM - FANS OPER IN EA SHIFT Twr 01	Twr 02	Twr 03
1	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0
19	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
21	0	0	0	0	0	0	0	0
22	0	0	0	0	0	0	0	0
23	0	0	0	0	0	0	0	0
24	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
26	0	0	0	0	0	0	0	0
27	0	0	0	0	0	0	0	0
28	0	0	0	0	0	0	0	0
AVERAGE	0	0	0	0	0	0	0	0

ASSUMPTIONS: Drift Rate = 0.00075%
TDS ppm = 0.77 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1990
CALCULATED TOWER PERFORMANCE PARAMETERS - UNIT 1

	Airflow /Tower. cu m/s			Heat	Calc	CW Flow	Calc Drift	
FEBRUARY DAY	Twr 01	Twr 02	Twr 03	BTU/min	TDS, ppm	gpm	gpm	lb/min
1	0	0	0	0.00E+00	0	29,000	0.000	0.000
2	0	0	0	0.00E+00	0	29,000	0.000	0.000
3	0	0	0	0.00E+00	0	29,000	0.000	0.000
4	0	0	0	0.00E+00	0	29,000	0.000	0.000
5	0	0	0	0.00E+00	0	29,000	0.000	0.000
6	0	0	0	0.00E+00	0	29,000	0.000	0.000
7	0	0	0	0.00E+00	0	29,000	0.000	0.000
8	0	0	0	0.00E+00	0	29,000	0.000	0.000
9	0	0	0	0.00E+00	0	29,000	0.000	0.000
10	0	0	0	0.00E+00	0	29,000	0.000	0.000
11	0	0	0	0.00E+00	0	29,000	0.000	0.000
12	0	0	0	0.00E+00	0	29,000	0.000	0.000
13	0	0	0	0.00E+00	0	29,000	0.000	0.000
14	0	0	0	0.00E+00	0	29,000	0.000	0.000
15	0	0	0	0.00E+00	0	29,000	0.000	0.000
16	0	0	0	0.00E+00	0	29,000	0.000	0.000
17	0	0	0	0.00E+00	0	29,000	0.000	0.000
18	0	0	0	0.00E+00	0	29,000	0.000	0.000
19	0	0	0	0.00E+00	0	29,000	0.000	0.000
20	0	0	0	0.00E+00	0	29,000	0.000	0.000
21	0	0	0	0.00E+00	0	29,000	0.000	0.000
22	0	0	0	0.00E+00	0	29,000	0.000	0.000
23	0	0	0	0.00E+00	0	29,000	0.000	0.000
24	0	0	0	0.00E+00	0	29,000	0.000	0.000
25	0	0	0	0.00E+00	0	29,000	0.000	0.000
26	0	0	0	0.00E+00	0	29,000	0.000	0.000
27	0	0	0	0.00E+00	0	29,000	0.000	0.000
28	0	0	0	0.00E+00	0	29,000	0.000	0.000
AVERAGE	0	0	0	0.00E+00	0	29,000	0.000	0.000

ASSUMPTIONS: Drift Rate = 0.00075%
TDS ppm = 0.77 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1990
INPUT DATA - UNIT 1

MARCH	DAY	CW CONDUCTIVITY DATA umhos/cm	THERMAL GEN MWt/d	CW FLOW - No PUMPS/SHIFT Mids	Days	Swings	SUM - FANS OPER IN EA SHIFT Twr 01	Twr 02	Twr 03
	1	0	0	0	0	0	0	0	0
	2	0	0	0	0	0	0	0	0
	3	0	0	0	0	0	0	0	0
	4	0	0	0	0	0	0	0	0
	5	0	0	0	0	0	0	0	0
	6	0	0	0	0	0	0	0	0
	7	0	0	0	0	0	0	0	0
	8	0	0	0	0	0	0	0	0
	9	0	0	0	0	0	0	0	0
	10	0	0	0	0	0	0	0	0
	11	0	0	0	0	0	0	0	0
	12	0	0	0	0	0	0	0	0
	13	0	0	0	0	0	0	0	0
	14	0	0	0	0	0	0	0	0
	15	0	0	0	0	0	0	0	0
	16	0	0	0	0	0	0	0	0
	17	0	0	0	0	0	0	0	0
	18	0	0	0	0	0	0	0	0
	19	0	0	0	0	0	0	0	0
	20	0	0	0	0	0	0	0	0
	21	0	0	0	0	0	0	0	0
	22	0	0	0	0	0	0	0	0
	23	0	0	0	0	0	0	0	0
	24	0	0	0	0	0	0	0	0
	25	0	0	0	0	0	0	0	0
	26	0	0	0	0	0	0	0	0
	27	0	0	0	0	0	0	0	0
	28	0	0	0	0	0	0	0	0
	29	0	0	0	0	0	0	0	0
	30	0	0	0	0	0	0	0	0
	31	0	0	0	0	0	0	0	0
AVERAGE		0	0	0	0	0	0	0	0

ASSUMPTIONS: Drift Rate = 0.00075%
TDS ppm = 0.77 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1990
CALCULATED TOWER PERFORMANCE PARAMETERS - UNIT 1

		Airflow /Tower. cu m/s			Heat	Calc	CW Flow	Calc Drift	
MARCH	DAY	Twr 01	Twr 02	Twr 03	BTU/min	TDS, ppm	gpm	gpm	lb/min
	1	0	0	0	0.00E+00	0	29,000	0.000	0.000
	2	0	0	0	0.00E+00	0	29,000	0.000	0.000
	3	0	0	0	0.00E+00	0	29,000	0.000	0.000
	4	0	0	0	0.00E+00	0	29,000	0.000	0.000
	5	0	0	0	0.00E+00	0	29,000	0.000	0.000
	6	0	0	0	0.00E+00	0	29,000	0.000	0.000
	7	0	0	0	0.00E+00	0	29,000	0.000	0.000
	8	0	0	0	0.00E+00	0	29,000	0.000	0.000
	9	0	0	0	0.00E+00	0	29,000	0.000	0.000
	10	0	0	0	0.00E+00	0	29,000	0.000	0.000
	11	0	0	0	0.00E+00	0	29,000	0.000	0.000
	12	0	0	0	0.00E+00	0	29,000	0.000	0.000
	13	0	0	0	0.00E+00	0	29,000	0.000	0.000
	14	0	0	0	0.00E+00	0	29,000	0.000	0.000
	15	0	0	0	0.00E+00	0	29,000	0.000	0.000
	16	0	0	0	0.00E+00	0	29,000	0.000	0.000
	17	0	0	0	0.00E+00	0	29,000	0.000	0.000
	18	0	0	0	0.00E+00	0	29,000	0.000	0.000
	19	0	0	0	0.00E+00	0	29,000	0.000	0.000
	20	0	0	0	0.00E+00	0	29,000	0.000	0.000
	21	0	0	0	0.00E+00	0	29,000	0.000	0.000
	22	0	0	0	0.00E+00	0	29,000	0.000	0.000
	23	0	0	0	0.00E+00	0	29,000	0.000	0.000
	24	0	0	0	0.00E+00	0	29,000	0.000	0.000
	25	0	0	0	0.00E+00	0	29,000	0.000	0.000
	26	0	0	0	0.00E+00	0	29,000	0.000	0.000
	27	0	0	0	0.00E+00	0	29,000	0.000	0.000
	28	0	0	0	0.00E+00	0	29,000	0.000	0.000
	29	0	0	0	0.00E+00	0	29,000	0.000	0.000
	30	0	0	0	0.00E+00	0	29,000	0.000	0.000
	31	0	0	0	0.00E+00	0	29,000	0.000	0.000
AVERAGE		0	0	0	0.00E+00	0	29,000	0.000	0.000

ASSUMPTIONS: Drift Rate = 0.00075%
TDS ppm = 0.77 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1990
INPUT DATA - UNIT 1

APRIL	DAY	CW CONDUCTIVITY DATA umhos/cm	THERMAL GEN MWt/d	CW FLOW - No PUMPS/SHIFT Mids	Days	Swings	SUM - FANS OPER IN EA SHIFT Twr 01	Twr 02	Twr 03
	1	0	0	0	0	0	0	0	0
	2	0	0	0	0	0	0	0	0
	3	0	0	0	0	0	0	0	0
	4	0	0	0	0	0	0	0	0
	5	0	0	0	0	0	0	0	0
	6	0	0	0	0	0	0	0	0
	7	0	0	0	0	0	0	0	0
	8	0	0	0	0	0	0	0	0
	9	0	0	0	0	0	0	0	0
	10	0	0	0	0	0	0	0	0
	11	0	0	0	0	0	0	0	0
	12	0	0	0	0	0	0	0	0
	13	0	0	0	0	0	0	0	0
	14	0	0	0	0	0	0	0	0
	15	0	0	0	0	0	0	0	0
	16	0	0	0	0	0	0	0	0
	17	0	0	0	0	0	0	0	0
	18	0	0	0	0	0	0	0	0
	19	0	0	0	0	0	0	0	0
	20	0	0	0	0	0	0	0	0
	21	0	0	0	0	0	0	0	0
	22	0	0	0	0	0	0	0	0
	23	0	0	0	0	0	0	0	0
	24	0	0	0	0	0	0	0	0
	25	0	0	0	0	0	0	0	0
	26	0	0	0	0	0	0	0	0
	27	0	0	0	0	0	0	0	0
	28	0	0	0	0	0	0	0	0
	29	0	0	0	0	0	0	0	0
	30	0	0	0	0	0	0	0	0
AVERAGE		0	0	0	0	0	0	0	0

ASSUMPTIONS: Drift Rate = 0.00075%
TDS ppm = 0.77 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM .
FOR 1990
CALCULATED TOWER PERFORMANCE PARAMETERS - UNIT 1

		Airflow /Tower. cu m/s			Heat	Calc	CW Flow	Calc Drift	
APRIL	DAY	Twr 01	Twr 02	Twr 03	BTU/min	TDS, ppm	gpm	gpm	lb/min
	1	0	0	0	0.00E+00	0	29,000	0.000	0.000
	2	0	0	0	0.00E+00	0	29,000	0.000	0.000
	3	0	0	0	0.00E+00	0	29,000	0.000	0.000
	4	0	0	0	0.00E+00	0	29,000	0.000	0.000
	5	0	0	0	0.00E+00	0	29,000	0.000	0.000
	6	0	0	0	0.00E+00	0	29,000	0.000	0.000
	7	0	0	0	0.00E+00	0	29,000	0.000	0.000
	8	0	0	0	0.00E+00	0	29,000	0.000	0.000
	9	0	0	0	0.00E+00	0	29,000	0.000	0.000
	10	0	0	0	0.00E+00	0	29,000	0.000	0.000
	11	0	0	0	0.00E+00	0	29,000	0.000	0.000
	12	0	0	0	0.00E+00	0	29,000	0.000	0.000
	13	0	0	0	0.00E+00	0	29,000	0.000	0.000
	14	0	0	0	0.00E+00	0	29,000	0.000	0.000
	15	0	0	0	0.00E+00	0	29,000	0.000	0.000
	16	0	0	0	0.00E+00	0	29,000	0.000	0.000
	17	0	0	0	0.00E+00	0	29,000	0.000	0.000
	18	0	0	0	0.00E+00	0	29,000	0.000	0.000
	19	0	0	0	0.00E+00	0	29,000	0.000	0.000
	20	0	0	0	0.00E+00	0	29,000	0.000	0.000
	21	0	0	0	0.00E+00	0	29,000	0.000	0.000
	22	0	0	0	0.00E+00	0	29,000	0.000	0.000
	23	0	0	0	0.00E+00	0	29,000	0.000	0.000
	24	0	0	0	0.00E+00	0	29,000	0.000	0.000
	25	0	0	0	0.00E+00	0	29,000	0.000	0.000
	26	0	0	0	0.00E+00	0	29,000	0.000	0.000
	27	0	0	0	0.00E+00	0	29,000	0.000	0.000
	28	0	0	0	0.00E+00	0	29,000	0.000	0.000
	29	0	0	0	0.00E+00	0	29,000	0.000	0.000
	30	0	0	0	0.00E+00	0	29,000	0.000	0.000
AVERAGE		0	0	0	0.00E+00	0	29,000	0.000	0.000

ASSUMPTIONS: Drift Rate = 0.00075%
TDS ppm = 0.77 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1990
INPUT DATA - UNIT 1

MAY	DAY	CW CONDUCTIVITY DATA umhos/cm	THERMAL GEN MWt/d	CW FLOW - No PUMPS/SHIFT Mids	Days	Swings	SUM - FANS OPER IN EA SHIFT Twr 01	Twr 02	Twr 03
	1	0	0	0	0	0	0	0	0
	2	0	0	0	0	0	0	0	0
	3	0	0	0	0	0	0	0	0
	4	0	0	0	0	0	0	0	0
	5	0	0	0	0	0	0	0	0
	6	0	0	0	0	0	0	0	0
	7	0	0	0	0	0	0	0	0
	8	0	0	0	0	0	0	0	0
	9	0	0	0	0	0	0	0	0
	10	0	0	0	0	0	0	0	0
	11	0	0	0	0	0	0	0	0
	12	0	0	0	0	0	0	0	0
	13	0	0	0	0	0	0	0	0
	14	0	0	0	0	0	0	0	0
	15	0	0	0	0	0	0	0	0
	16	0	0	0	0	0	0	0	0
	17	0	0	0	0	0	0	0	0
	18	0	0	0	0	0	0	0	0
	19	0	0	0	0	0	0	0	0
	20	0	0	0	0	0	0	0	0
	21	0	0	0	0	0	0	0	0
	22	0	0	0	0	0	0	0	0
	23	0	0	0	0	0	0	0	0
	24	0	0	0	0	0	0	0	0
	25	0	0	0	0	0	0	0	0
	26	0	0	0	0	0	0	0	0
	27	0	0	0	0	0	0	0	0
	28	0	0	0	0	0	0	0	0
	29	0	0	0	0	0	0	0	0
	30	0	0	0	0	0	0	0	0
	31	0	0	0	0	0	0	0	0
AVERAGE		0	0	0	0	0	0	0	0

ASSUMPTIONS: Drift Rate = 0.00075%
TDS ppm = 0.77 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

·COOLING TOWER SOURCE TERM
FOR 1990
CALCULATED TOWER PERFORMANCE PARAMETERS - UNIT 1

MAY	DAY	Airflow /Tower. cu m/s Twr 01	Twr 02	Twr 03	Heat BTU/min	Calc TDS, ppm	CW Flow gpm	Calc Drift gpm	lb/min
	1	0	0	0	0.00E+00	0	29,000	0.000	0.000
	2	0	0	0	0.00E+00	0	29,000	0.000	0.000
	3	0	0	0	0.00E+00	0	29,000	0.000	0.000
	4	0	0	0	0.00E+00	0	29,000	0.000	0.000
	5	0	0	0	0.00E+00	0	29,000	0.000	0.000
	6	0	0	0	0.00E+00	0	29,000	0.000	0.000
	7	0	0	0	0.00E+00	0	29,000	0.000	0.000
	8	0	0	0	0.00E+00	0	29,000	0.000	0.000
	9	0	0	0	0.00E+00	0	29,000	0.000	0.000
	10	0	0	0	0.00E+00	0	29,000	0.000	0.000
	11	0	0	0	0.00E+00	0	29,000	0.000	0.000
	12	0	0	0	0.00E+00	0	29,000	0.000	0.000
	13	0	0	0	0.00E+00	0	29,000	0.000	0.000
	14	0	0	0	0.00E+00	0	29,000	0.000	0.000
	15	0	0	0	0.00E+00	0	29,000	0.000	0.000
	16	0	0	0	0.00E+00	0	29,000	0.000	0.000
	17	0	0	0	0.00E+00	0	29,000	0.000	0.000
	18	0	0	0	0.00E+00	0	29,000	0.000	0.000
	19	0	0	0	0.00E+00	0	29,000	0.000	0.000
	20	0	0	0	0.00E+00	0	29,000	0.000	0.000
	21	0	0	0	0.00E+00	0	29,000	0.000	0.000
	22	0	0	0	0.00E+00	0	29,000	0.000	0.000
	23	0	0	0	0.00E+00	0	29,000	0.000	0.000
	24	0	0	0	0.00E+00	0	29,000	0.000	0.000
	25	0	0	0	0.00E+00	0	29,000	0.000	0.000
	26	0	0	0	0.00E+00	0	29,000	0.000	0.000
	27	0	0	0	0.00E+00	0	29,000	0.000	0.000
	28	0	0	0	0.00E+00	0	29,000	0.000	0.000
	29	0	0	0	0.00E+00	0	29,000	0.000	0.000
	30	0	0	0	0.00E+00	0	29,000	0.000	0.000
	31	0	0	0	0.00E+00	0	29,000	0.000	0.000
AVERAGE		0	0	0	0.00E+00	0	29,000	0.000	0.000

ASSUMPTIONS: Drift Rate = 0.00075%
TDS ppm = 0.77 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1990
INPUT DATA - UNIT 1

JUNE	DAY	CW CONDUCTIVITY DATA umhos/cm	THERMAL GEN MWt/d	CW FLOW - No PUMPS/SHIFT Mids	Days	Swings	SUM - FANS OPER IN EA SHIFT Twr 01	Twr 02	Twr 03
	1	0	0	0	0	0	0	0	0
	2	0	0	0	0	0	0	0	0
	3	0	0	0	0	0	0	0	0
	4	0	0	0	0	0	0	0	0
	5	0	0	0	0	0	0	0	0
	6	0	0	0	0	0	0	0	0
	7	0	0	0	0	0	0	0	0
	8	0	0	0	0	0	0	0	0
	9	0	0	0	0	0	0	0	0
	10	0	0	0	0	0	0	0	0
	11	0	0	0	0	0	0	0	0
	12	0	0	0	0	0	0	0	0
	13	0	0	0	0	0	0	0	0
	14	0	0	0	0	0	0	0	0
	15	0	0	0	0	0	0	0	0
	16	0	0	0	0	0	0	0	0
	17	0	0	0	0	0	0	0	0
	18	0	0	0	0	0	0	0	0
	19	0	0	0	0	0	0	0	0
	20	0	0	0	0	0	0	0	0
	21	0	0	0	0	0	0	0	0
	22	0	0	0	0	0	0	0	0
	23	0	0	0	0	0	0	0	0
	24	0	0	0	0	0	0	0	0
	25	0	0	0	0	0	0	0	0
	26	0	0	0	0	0	0	0	0
	27	0	0	0	0	0	0	0	0
	28	0	0	0	0	0	0	0	0
	29	0	0	0	0	0	0	0	0
	30	0	0	0	0	0	0	0	0
AVERAGE		0	0	0	0	0	0	0	0

ASSUMPTIONS: Drift Rate = 0.00075%
TDS ppm = 0.77 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1990
CALCULATED TOWER PERFORMANCE PARAMETERS - UNIT 1

		Airflow /Tower. cu m/s			Heat	Calc	CW Flow	Calc Drift	
JUNE	DAY	Twr 01	Twr 02	Twr 03	BTU/min	TDS, ppm	gpm	gpm	lb/min
	1	0	0	0	0.00E+00	0	29,000	0.000	0.000
	2	0	0	0	0.00E+00	0	29,000	0.000	0.000
	3	0	0	0	0.00E+00	0	29,000	0.000	0.000
	4	0	0	0	0.00E+00	0	29,000	0.000	0.000
	5	0	0	0	0.00E+00	0	29,000	0.000	0.000
	6	0	0	0	0.00E+00	0	29,000	0.000	0.000
	7	0	0	0	0.00E+00	0	29,000	0.000	0.000
	8	0	0	0	0.00E+00	0	29,000	0.000	0.000
	9	0	0	0	0.00E+00	0	29,000	0.000	0.000
	10	0	0	0	0.00E+00	0	29,000	0.000	0.000
	11	0	0	0	0.00E+00	0	29,000	0.000	0.000
	12	0	0	0	0.00E+00	0	29,000	0.000	0.000
	13	0	0	0	0.00E+00	0	29,000	0.000	0.000
	14	0	0	0	0.00E+00	0	29,000	0.000	0.000
	15	0	0	0	0.00E+00	0	29,000	0.000	0.000
	16	0	0	0	0.00E+00	0	29,000	0.000	0.000
	17	0	0	0	0.00E+00	0	29,000	0.000	0.000
	18	0	0	0	0.00E+00	0	29,000	0.000	0.000
	19	0	0	0	0.00E+00	0	29,000	0.000	0.000
	20	0	0	0	0.00E+00	0	29,000	0.000	0.000
	21	0	0	0	0.00E+00	0	29,000	0.000	0.000
	22	0	0	0	0.00E+00	0	29,000	0.000	0.000
	23	0	0	0	0.00E+00	0	29,000	0.000	0.000
	24	0	0	0	0.00E+00	0	29,000	0.000	0.000
	25	0	0	0	0.00E+00	0	29,000	0.000	0.000
	26	0	0	0	0.00E+00	0	29,000	0.000	0.000
	27	0	0	0	0.00E+00	0	29,000	0.000	0.000
	28	0	0	0	0.00E+00	0	29,000	0.000	0.000
	29	0	0	0	0.00E+00	0	29,000	0.000	0.000
	30	0	0	0	0.00E+00	0	29,000	0.000	0.000
AVERAGE		0	0	0	0.00E+00	0	29,000	0.000	0.000

ASSUMPTIONS: Drift Rate = 0.00075%
TDS ppm = 0.77 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1990
INPUT DATA - UNIT 1

JULY	DAY	CW CONDUCTIVITY DATA umhos/cm	THERMAL GEN MWt/d	CW FLOW - No PUMPS/SHIFT Mids	Days	Swings	SUM - FANS OPER IN EA SHIFT Twr 01	Twr 02	Twr 03
	1	7,480	0	2	2	2	46	35	18
	2	8,120	0	2	2	2	48	29	19
	3	8,995	0	2	2	2	48	30	21
	4	9,465	0	2	2	2	48	30	19
	5	10,495	0	2	2	3	48	30	0
	6	11,540	14,309	3	3	4	48	27	0
	7	11,250	27,187	4	4	4	45	27	5
	8	12,100	52,276	4	4	4	47	31	28
	9	14,950	62,800	4	4	4	48	48	33
	10	16,900	62,782	4	4	4	48	48	34
	11	19,100	74,766	4	4	4	48	48	36
	12	21,750	84,506	4	4	4	48	48	42
	13	22,350	90,917	4	4	4	45	48	45
	14	24,350	90,416	4	4	4	45	48	45
	15	25,850	90,343	4	4	4	45	48	45
	16	23,750	90,379	4	4	4	46	48	45
	17	24,195	90,598	4	4	4	48	48	46
	18	24,800	90,936	4	4	4	48	48	47
	19	24,600	90,908	4	4	4	48	48	46
	20	24,350	90,407	4	4	4	48	48	45
	21	25,750	87,570	4	4	4	48	48	44
	22	24,900	90,881	4	4	4	48	48	45
	23	24,750	90,853	4	4	4	48	48	45
	24	24,450	90,835	4	4	4	48	48	45
	25	24,150	90,908	4	4	4	48	48	45
	26	24,450	90,771	4	4	4	48	48	45
	27	23,650	90,781	4	4	4	48	48	45
	28	23,600	90,698	4	4	4	48	48	45
	29	23,850	90,881	4	4	4	48	48	45
	30	26,450	90,890	4	4	4	48	48	45
	31	24,800	90,890	4	4	4	48	48	45
AVERAGE		19,909	67,725	4	4	4	47	43	36

ASSUMPTIONS: Drift Rate = 0.00075%
TDS ppm = 0.76 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM

FOR 1990

CALCULATED TOWER PERFORMANCE PARAMETERS - UNIT 1

JULY	DAY	Airflow /Tower. cu m/s Twr 01	Twr 02	Twr 03	Heat BTU/min	Calc TDS, ppm	CW Flow gpm	Calc Drift gpm	lb/min
	1	9,706	7,385	3,798	0.00E+00	5,685	309,000	1.593	0.076
	2	10,128	6,119	4,009	0.00E+00	6,171	309,000	1.545	0.080
	3	10,128	6,330	4,431	0.00E+00	6,836	309,000	1.593	0.091
	4	10,128	6,330	4,009	0.00E+00	7,193	309,000	1.561	0.094
	5	10,128	6,330	0	0.00E+00	7,976	355,667	1.445	0.096
	6	10,128	5,697	0	3.39E+07	8,770	495,667	1.936	0.142
	7	9,495	5,697	1,055	6.44E+07	8,550	589,000	2.362	0.169
	8	9,917	6,541	5,908	1.24E+08	9,196	589,000	3.252	0.250
	9	10,128	10,128	6,963	1.49E+08	11,362	589,000	3.957	0.375
	10	10,128	10,128	7,174	1.49E+08	12,844	589,000	3.988	0.427
	11	10,128	10,128	7,596	1.77E+08	14,516	589,000	4.049	0.491
	12	10,128	10,128	8,862	2.00E+08	16,530	589,000	4.233	0.584
	13	9,495	10,128	9,495	2.15E+08	16,986	589,000	4.233	0.600
	14	9,495	10,128	9,495	2.14E+08	18,506	589,000	4.233	0.654
	15	9,495	10,128	9,495	2.14E+08	19,646	589,000	4.233	0.694
	16	9,706	10,128	9,495	2.14E+08	18,050	589,000	4.264	0.642
	17	10,128	10,128	9,706	2.15E+08	18,388	589,000	4.356	0.668
	18	10,128	10,128	9,917	2.16E+08	18,848	589,000	4.387	0.690
	19	10,128	10,128	9,706	2.15E+08	18,696	589,000	4.356	0.680
	20	10,128	10,128	9,495	2.14E+08	18,506	589,000	4.325	0.668
	21	10,128	10,128	9,284	2.08E+08	19,570	589,000	4.295	0.701
	22	10,128	10,128	9,495	2.15E+08	18,924	589,000	4.325	0.683
	23	10,128	10,128	9,495	2.15E+08	18,810	589,000	4.325	0.679
	24	10,128	10,128	9,495	2.15E+08	18,582	589,000	4.325	0.671
	25	10,128	10,128	9,495	2.15E+08	18,354	589,000	4.325	0.663
	26	10,128	10,128	9,495	2.15E+08	18,582	589,000	4.325	0.671
	27	10,128	10,128	9,495	2.15E+08	17,974	589,000	4.325	0.649
	28	10,128	10,128	9,495	2.15E+08	17,936	589,000	4.325	0.647
	29	10,128	10,128	9,495	2.15E+08	18,126	589,000	4.325	0.654
	30	10,128	10,128	9,495	2.15E+08	20,102	589,000	4.325	0.726
	31	10,128	10,128	9,495	2.15E+08	18,848	589,000	4.325	0.680
AVERAGE		10,012	9,141	7,576	1.61E+08	15,131	542,333	3.660	0.503

ASSUMPTIONS: Drift Rate = 0.00075%

TDS ppm = 0.76 x Conductivity, umhos/cm

Airflow = 64.4 E 06 cfm/ 48 fans

CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1990
INPUT DATA - UNIT 1

AUGUST	DAY	CW CONDUCTIVITY DATA umhos/cm	THERMAL GEN MWt/d	CW FLOW - No PUMPS/SHIFT Mids	Days	Swings	SUM - FANS OPER IN EA SHIFT Twr 01	Twr 02	Twr 03
	1	25,400	90,917	4	4	4	48	48	45
	2	27,300	90,954	4	4	4	48	48	45
	3	27,400	90,945	4	4	4	48	48	45
	4	28,000	90,963	4	4	4	48	48	45
	5	28,700	90,926	4	4	4	48	48	45
	6	28,900	90,945	4	4	4	48	48	45
	7	29,650	90,936	4	4	4	48	48	45
	8	28,550	90,917	4	4	4	48	48	45
	9	28,200	90,890	4	4	4	48	48	45
	10	26,600	90,926	4	4	4	48	48	45
	11	27,850	90,689	4	4	4	48	48	45
	12	27,400	90,926	4	4	4	48	48	45
	13	26,750	90,926	4	4	4	48	48	45
	14	24,750	90,361	4	4	4	48	48	45
	15	24,050	0	4	2	2	16	16	15
	16	24,400	0	2	2	2	0	0	0
	17	25,100	0	2	2	2	0	0	0
	18	23,950	0	2	2	2	0	0	0
	19	23,300	10,242	2	2	3	5	6	0
	20	23,300	56,535	4	4	4	41	35	31
	21	24,150	90,607	4	4	4	48	48	48
	22	25,350	90,735	4	4	4	48	48	48
	23	26,300	90,288	4	4	4	48	48	48
	24	25,100	90,872	4	4	4	48	48	48
	25	27,650	90,908	4	4	4	48	48	48
	26	28,700	90,881	4	4	4	48	48	48
	27	28,200	90,817	4	4	4	48	48	48
	28	28,600	90,835	4	4	4	48	48	48
	29	28,000	90,790	4	4	4	48	48	48
	30	27,950	90,872	4	4	4	48	48	48
	31	26,000	90,945	4	4	4	48	48	48
AVERAGE		26,631	75,405	4	4	4	41	41	39

ASSUMPTIONS: Drift Rate = 0.00075%
TDS ppm = 0.74 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM

FOR 1990

CALCULATED TOWER PERFORMANCE PARAMETERS - UNIT 1

		Airflow /Tower. cu m/s			Heat	Calc	CW Flow	Calc Drift	
AUGUST	DAY	Twr 01	Twr 02	Twr 03	BTU/min	TDS, ppm	gpm	gpm	lb/min
	1	10,128	10,128	9,495	2.15E+08	18,796	589,000	4.325	0.678
	2	10,128	10,128	9,495	2.16E+08	20,202	589,000	4.325	0.729
	3	10,128	10,128	9,495	2.16E+08	20,276	589,000	4.325	0.732
	4	10,128	10,128	9,495	2.16E+08	20,720	589,000	4.325	0.748
	5	10,128	10,128	9,495	2.15E+08	21,238	589,000	4.325	0.767
	6	10,128	10,128	9,495	2.16E+08	21,386	589,000	4.325	0.772
	7	10,128	10,128	9,495	2.16E+08	21,941	589,000	4.325	0.792
	8	10,128	10,128	9,495	2.15E+08	21,127	589,000	4.325	0.763
	9	10,128	10,128	9,495	2.15E+08	20,868	589,000	4.325	0.753
	10	10,128	10,128	9,495	2.15E+08	19,684	589,000	4.325	0.711
	11	10,128	10,128	9,495	2.15E+08	20,609	589,000	4.325	0.744
	12	10,128	10,128	9,495	2.15E+08	20,276	589,000	4.325	0.732
	13	10,128	10,128	9,495	2.15E+08	19,795	589,000	4.325	0.715
	14	10,128	10,128	9,495	2.14E+08	18,315	589,000	4.325	0.661
	15	3,376	3,376	3,165	0.00E+00	17,797	402,333	0.985	0.146
	16	0	0	0	0.00E+00	18,056	309,000	0.000	0.000
	17	0	0	0	0.00E+00	18,574	309,000	0.000	0.000
	18	0	0	0	0.00E+00	17,723	309,000	0.000	0.000
	19	1,055	1,266	0	2.43E+07	17,242	355,667	0.204	0.029
	20	8,651	7,385	6,541	1.34E+08	17,242	589,000	3.282	0.472
	21	10,128	10,128	10,128	2.15E+08	17,871	589,000	4.418	0.659
	22	10,128	10,128	10,128	2.15E+08	18,759	589,000	4.418	0.692
	23	10,128	10,128	10,128	2.14E+08	19,462	589,000	4.418	0.717
	24	10,128	10,128	10,128	2.15E+08	18,574	589,000	4.418	0.685
	25	10,128	10,128	10,128	2.15E+08	20,461	589,000	4.418	0.754
	26	10,128	10,128	10,128	2.15E+08	21,238	589,000	4.418	0.783
	27	10,128	10,128	10,128	2.15E+08	20,868	589,000	4.418	0.769
	28	10,128	10,128	10,128	2.15E+08	21,164	589,000	4.418	0.780
	29	10,128	10,128	10,128	2.15E+08	20,720	589,000	4.418	0.764
	30	10,128	10,128	10,128	2.15E+08	20,683	589,000	4.418	0.762
	31	10,128	10,128	10,128	2.16E+08	19,240	589,000	4.418	0.709
AVERAGE		8,590	8,556	8,195	1.79E+08	19,707	548,355	3.665	0.613

ASSUMPTIONS: Drift Rate = 0.00075%

TDS ppm = 0.74 x Conductivity, umhos/cm

Airflow = 64.4 E 06 cfm/ 48 fans

CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1990
INPUT DATA - UNIT 1

SEPTEMBER DAY	CW CONDUCTIVITY DATA umhos/cm	THERMAL GEN MWt/d	CW FLOW - No PUMPS/SHIFT Mids	Days	Swings	SUM - FANS OPER IN EA SHIFT Twr 01	Twr 02	Twr 03
1	26,600	90,999	4	4	4	48	48	48
2	27,050	90,926	4	4	4	48	48	48
3	26,000	90,972	4	4	4	48	48	48
4	25,800	90,881	4	4	4	48	48	48
5	25,250	90,908	4	4	4	45	48	48
6	25,800	90,926	4	4	4	46	48	48
7	26,350	91,018	4	4	4	48	45	48
8	29,200	90,872	4	4	4	48	45	48
9	29,650	90,863	4	4	4	48	45	48
10	29,650	90,963	4	4	4	48	45	48
11	30,100	90,926	4	4	4	48	45	48
12	31,450	90,972	4	4	4	48	45	48
13	31,200	45,071	4	4	3	40	38	40
14	29,850	0	2	2	1	0	0	0
15	27,000	0	0	0	0	0	0	0
16	26,450	0	0	0	0	0	0	0
17	25,500	0	0	0	0	0	0	0
18	24,400	0	0	0	0	0	0	0
19	23,950	0	0	0	0	0	0	0
20	24,700	0	0	2	2	0	0	0
21	26,450	0	2	2	2	0	0	0
22	26,100	0	2	2	2	0	0	0
23	25,250	0	2	2	2	0	0	0
24	24,400	3,894	2	2	2	0	32	0
25	26,800	57,967	2	4	4	32	48	8
26	25,350	90,826	4	4	4	48	48	46
27	26,250	90,999	4	4	4	48	48	48
28	27,000	90,899	4	4	4	48	48	48
29	27,500	90,926	4	4	4	48	48	48
30	28,800	91,027	4	4	4	48	48	48
AVERAGE	26,995	55,095	3	3	3	29	31	29

ASSUMPTIONS: Drift Rate = 0.00075%
TDS ppm = 0.75 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1990
CALCULATED TOWER PERFORMANCE PARAMETERS - UNIT 1

	Airflow /Tower. cu m/s			Heat	Calc	CW Flow	Calc Drift	
SEPTEMBER DAY	Twr 01	Twr 02	Twr 03	BTU/min	TDS, ppm	gpm	gpm	lb/min
1	10,128	10,128	10,128	2.16E+08	19,950	589,000	4.418	0.735
2	10,128	10,128	10,128	2.15E+08	20,288	589,000	4.418	0.748
3	10,128	10,128	10,128	2.16E+08	19,500	589,000	4.418	0.719
4	10,128	10,128	10,128	2.15E+08	19,350	589,000	4.418	0.713
5	9,495	10,128	10,128	2.15E+08	18,938	589,000	4.325	0.684
6	9,706	10,128	10,128	2.15E+08	19,350	589,000	4.356	0.703
7	10,128	9,495	10,128	2.16E+08	19,763	589,000	4.325	0.713
8	10,128	9,495	10,128	2.15E+08	21,900	589,000	4.325	0.791
9	10,128	9,495	10,128	2.15E+08	22,238	589,000	4.325	0.803
10	10,128	9,495	10,128	2.16E+08	22,238	589,000	4.325	0.803
11	10,128	9,495	10,128	2.15E+08	22,575	589,000	4.325	0.815
12	10,128	9,495	10,128	2.16E+08	23,588	589,000	4.325	0.851
13	8,440	8,018	8,440	1.07E+08	23,400	542,333	3.333	0.651
14	0	0	0	0.00E+00	22,388	262,333	0.000	0.000
15	0	0	0	0.00E+00	20,250	29,000	0.000	0.000
16	0	0	0	0.00E+00	19,838	29,000	0.000	0.000
17	0	0	0	0.00E+00	19,125	29,000	0.000	0.000
18	0	0	0	0.00E+00	18,300	29,000	0.000	0.000
19	0	0	0	0.00E+00	17,963	29,000	0.000	0.000
20	0	0	0	0.00E+00	18,525	215,667	0.000	0.000
21	0	0	0	0.00E+00	19,838	309,000	0.000	0.000
22	0	0	0	0.00E+00	19,575	309,000	0.000	0.000
23	0	0	0	0.00E+00	18,938	309,000	0.000	0.000
24	0	6,752	0	9.23E+06	18,300	309,000	0.515	0.079
25	6,752	10,128	1,688	1.37E+08	20,100	495,667	2.272	0.381
26	10,128	10,128	9,706	2.15E+08	19,013	589,000	4.356	0.691
27	10,128	10,128	10,128	2.16E+08	19,688	589,000	4.418	0.726
28	10,128	10,128	10,128	2.15E+08	20,250	589,000	4.418	0.746
29	10,128	10,128	10,128	2.15E+08	20,625	589,000	4.418	0.760
30	10,128	10,128	10,128	2.16E+08	21,600	589,000	4.418	0.796
AVERAGE	6,210	6,443	6,063	1.31E+08	20,246	430,333	2.682	0.464

ASSUMPTIONS: Drift Rate = 0.00075%
TDS ppm = 0.75 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1990
INPUT DATA - UNIT 1

OCTOBER	DAY	CW CONDUCTIVITY DATA umhos/cm	THERMAL GEN MWt/d	CW FLOW - No PUMPS/SHIFT Mids	Days	Swings	SUM - FANS OPER IN EA SHIFT Twr 01	Twr 02	Twr 03
	1	30,050	90,972	4	4	4	48	48	48
	2	29,400	69,212	4	4	4	48	48	24
	3	30,000	90,853	4	4	4	48	48	48
	4	29,850	90,936	4	4	4	48	48	48
	5	29,700	90,881	4	4	4	48	48	48
	6	29,500	90,917	4	4	4	48	48	47
	7	30,450	90,899	4	4	4	48	48	48
	8	29,600	90,963	4	4	4	48	48	48
	9	28,950	91,036	4	4	4	48	48	48
	10	27,250	90,990	4	4	4	48	48	48
	11	27,100	90,972	4	4	4	48	48	48
	12	27,250	91,009	4	4	4	48	48	48
	13	27,650	90,954	4	4	4	48	48	48
	14	27,250	90,972	4	4	4	48	48	48
	15	26,750	90,908	4	4	4	48	48	48
	16	27,250	90,926	4	4	4	48	48	48
	17	28,450	90,899	4	4	4	48	48	48
	18	27,050	90,753	4	4	4	48	48	48
	19	27,800	90,872	4	4	4	48	48	48
	20	26,550	90,917	4	4	4	48	48	48
	21	26,000	90,990	4	4	4	48	48	48
	22	23,300	90,945	4	4	4	48	48	48
	23	25,850	90,954	4	4	4	48	48	48
	24	25,800	90,972	4	4	4	48	48	48
	25	25,850	90,945	4	4	4	48	48	48
	26	25,900	90,936	4	4	4	48	48	48
	27	25,900	90,908	4	4	4	48	48	48
	28	25,800	90,990	4	4	4	48	48	48
	29	26,400	90,863	4	4	4	48	48	48
	30	25,650	90,899	4	4	4	48	48	48
	31	26,300	90,844	4	4	4	48	48	48
AVERAGE		27,439	90,229	4	4	4	48	48	47

ASSUMPTIONS: Drift Rate = 0.00075%
TDS ppm = 0.75 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1990
CALCULATED TOWER PERFORMANCE PARAMETERS - UNIT 1

		Airflow /Tower. cu m/s			Heat	Calc	CW Flow	Calc Drift	
OCTOBER	DAY	Twr 01	Twr 02	Twr 03	BTU/min	TDS, ppm	gpm	gpm	lb/min
	1	10,128	10,128	10,128	2.16E+08	22,538	589,000	4.418	0.831
	2	10,128	10,128	5,064	1.64E+08	22,050	589,000	3.681	0.677
	3	10,128	10,128	10,128	2.15E+08	22,500	589,000	4.418	0.829
	4	10,128	10,128	10,128	2.16E+08	22,388	589,000	4.418	0.825
	5	10,128	10,128	10,128	2.15E+08	22,275	589,000	4.418	0.821
	6	10,128	10,128	9,917	2.15E+08	22,125	589,000	4.387	0.810
	7	10,128	10,128	10,128	2.15E+08	22,838	589,000	4.418	0.842
	8	10,128	10,128	10,128	2.16E+08	22,200	589,000	4.418	0.818
	9	10,128	10,128	10,128	2.16E+08	21,713	589,000	4.418	0.800
	10	10,128	10,128	10,128	2.16E+08	20,438	589,000	4.418	0.753
	11	10,128	10,128	10,128	2.16E+08	20,325	589,000	4.418	0.749
	12	10,128	10,128	10,128	2.16E+08	20,438	589,000	4.418	0.753
	13	10,128	10,128	10,128	2.16E+08	20,738	589,000	4.418	0.764
	14	10,128	10,128	10,128	2.16E+08	20,438	589,000	4.418	0.753
	15	10,128	10,128	10,128	2.15E+08	20,063	589,000	4.418	0.740
	16	10,128	10,128	10,128	2.15E+08	20,438	589,000	4.418	0.753
	17	10,128	10,128	10,128	2.15E+08	21,338	589,000	4.418	0.787
	18	10,128	10,128	10,128	2.15E+08	20,288	589,000	4.418	0.748
	19	10,128	10,128	10,128	2.15E+08	20,850	589,000	4.418	0.769
	20	10,128	10,128	10,128	2.15E+08	19,913	589,000	4.418	0.734
	21	10,128	10,128	10,128	2.16E+08	19,500	589,000	4.418	0.719
	22	10,128	10,128	10,128	2.16E+08	17,475	589,000	4.418	0.644
	23	10,128	10,128	10,128	2.16E+08	19,388	589,000	4.418	0.715
	24	10,128	10,128	10,128	2.16E+08	19,350	589,000	4.418	0.713
	25	10,128	10,128	10,128	2.16E+08	19,388	589,000	4.418	0.715
	26	10,128	10,128	10,128	2.16E+08	19,425	589,000	4.418	0.716
	27	10,128	10,128	10,128	2.15E+08	19,425	589,000	4.418	0.716
	28	10,128	10,128	10,128	2.16E+08	19,350	589,000	4.418	0.713
	29	10,128	10,128	10,128	2.15E+08	19,800	589,000	4.418	0.730
	30	10,128	10,128	10,128	2.15E+08	19,238	589,000	4.418	0.709
	31	10,128	10,128	10,128	2.15E+08	19,725	589,000	4.418	0.727
AVERAGE		10,128	10,128	9,958	2.14E+08	20,579	589,000	4.393	0.754

ASSUMPTIONS: Drift Rate = 0.00075%
TDS ppm = 0.75 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1990
INPUT DATA - UNIT 1

NOVEMBER DAY	CW CONDUCTIVITY DATA umhos/cm	THERMAL GEN MWt/d	CW FLOW - No PUMPS/SHIFT Mids	Days	Swings	SUM - FANS OPER IN EA SHIFT Twr 01	Twr 02	Twr 03
1	25,950	90,844	4	4	4	48	48	48
2	25,700	90,954	4	4	4	48	48	48
3	24,650	90,954	4	4	4	48	48	48
4	24,700	90,926	4	4	4	48	48	48
5	24,400	90,926	4	4	4	48	48	48
6	24,450	90,926	4	4	4	48	48	48
7	25,100	90,954	4	4	4	48	48	48
8	25,000	90,936	4	4	4	48	48	48
9	23,200	90,963	4	4	4	48	48	48
10	24,400	90,945	4	4	4	48	48	48
11	25,400	90,945	4	4	4	48	48	48
12	25,700	90,972	4	4	4	48	48	48
13	26,200	90,972	4	4	4	48	48	48
14	25,600	90,990	4	4	4	48	48	48
15	25,500	91,018	4	4	4	48	48	48
16	25,500	90,990	4	4	4	48	48	48
17	25,900	90,990	4	4	4	48	48	48
18	25,700	90,945	4	4	4	48	48	48
19	24,200	90,999	4	4	4	48	48	48
20	25,800	91,045	4	4	4	48	48	48
21	24,100	91,054	4	4	4	48	48	48
22	23,500	90,954	4	4	4	48	48	48
23	23,900	90,972	4	4	4	48	48	48
24	23,100	67,114	4	4	4	48	39	24
25	23,600	90,890	4	4	4	48	48	45
26	25,700	90,945	4	4	4	48	48	45
27	21,300	90,915	4	4	4	48	48	45
28	21,000	90,963	4	4	4	48	48	45
29	21,400	90,954	4	4	4	48	48	45
30	22,700	90,981	4	4	4	48	48	45
AVERAGE	24,445	90,165	4	4	4	48	48	47

ASSUMPTIONS: Drift Rate = 0.00075%
TDS ppm = 0.86 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1990
CALCULATED TOWER PERFORMANCE PARAMETERS - UNIT 1

NOVEMBER DAY	Airflow /Tower. cu m/s Twr 01	Twr 02	Twr 03	Heat BTU/min	Calc TDS, ppm	CW Flow gpm	Calc Drift gpm	lb/min
1	10,128	10,128	10,128	2.15E+08	22,317	589,000	4.418	0.823
2	10,128	10,128	10,128	2.16E+08	22,102	589,000	4.418	0.815
3	10,128	10,128	10,128	2.16E+08	21,199	589,000	4.418	0.781
4	10,128	10,128	10,128	2.15E+08	21,242	589,000	4.418	0.783
5	10,128	10,128	10,128	2.15E+08	20,984	589,000	4.418	0.774
6	10,128	10,128	10,128	2.15E+08	21,027	589,000	4.418	0.775
7	10,128	10,128	10,128	2.16E+08	21,586	589,000	4.418	0.796
8	10,128	10,128	10,128	2.16E+08	21,500	589,000	4.418	0.793
9	10,128	10,128	10,128	2.16E+08	19,952	589,000	4.418	0.736
10	10,128	10,128	10,128	2.16E+08	20,984	589,000	4.418	0.774
11	10,128	10,128	10,128	2.16E+08	21,844	589,000	4.418	0.805
12	10,128	10,128	10,128	2.16E+08	22,102	589,000	4.418	0.815
13	10,128	10,128	10,128	2.16E+08	22,532	589,000	4.418	0.831
14	10,128	10,128	10,128	2.16E+08	22,016	589,000	4.418	0.812
15	10,128	10,128	10,128	2.16E+08	21,930	589,000	4.418	0.808
16	10,128	10,128	10,128	2.16E+08	21,930	589,000	4.418	0.808
17	10,128	10,128	10,128	2.16E+08	22,274	589,000	4.418	0.821
18	10,128	10,128	10,128	2.16E+08	22,102	589,000	4.418	0.815
19	10,128	10,128	10,128	2.16E+08	20,812	589,000	4.418	0.767
20	10,128	10,128	10,128	2.16E+08	22,188	589,000	4.418	0.818
21	10,128	10,128	10,128	2.16E+08	20,726	589,000	4.418	0.764
22	10,128	10,128	10,128	2.16E+08	20,210	589,000	4.418	0.745
23	10,128	10,128	10,128	2.16E+08	20,554	589,000	4.418	0.758
24	10,128	8,229	5,064	1.59E+08	19,866	589,000	3.405	0.565
25	10,128	10,128	9,495	2.15E+08	20,296	589,000	4.325	0.733
26	10,128	10,128	9,495	2.16E+08	22,102	589,000	4.325	0.798
27	10,128	10,128	9,495	2.15E+08	18,318	589,000	4.325	0.661
28	10,128	10,128	9,495	2.16E+08	18,060	589,000	4.325	0.652
29	10,128	10,128	9,495	2.16E+08	18,404	589,000	4.325	0.664
30	10,128	10,128	9,495	2.16E+08	19,522	589,000	4.325	0.705
AVERAGE	10,128	10,065	9,833	2.14E+08	21,023	589,000	4.365	0.766

ASSUMPTIONS: Drift Rate = 0.00075%
TDS ppm = 0.86 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1990
INPUT DATA - UNIT 1

DECEMBER DAY	CW CONDUCTIVITY DATA umhos/cm	THERMAL GEN MWt/d	CW FLOW - No PUMPS/SHIFT Mids	Days	Swings	SUM - FANS OPER IN EA SHIFT Twr 01	Twr 02	Twr 03
1	22,200	90,945	4	4	4	48	48	45
2	21,900	91,072	4	4	4	48	48	45
3	23,400	90,945	4	4	4	48	48	45
4	23,300	90,988	4	4	4	48	48	45
5	22,500	90,945	4	4	4	48	48	45
6	22,500	90,999	4	4	4	48	48	46
7	24,100	90,954	4	4	4	48	48	48
8	23,800	91,018	4	4	4	48	48	46
9	23,500	91,018	4	4	4	48	48	45
10	21,800	90,999	4	4	4	48	48	45
11	21,800	90,936	4	4	4	48	48	45
12	24,000	90,917	4	4	4	48	48	42
13	24,500	90,917	4	4	4	48	48	43
14	22,500	90,972	4	4	4	48	48	48
15	21,900	90,990	4	4	4	48	48	48
16	23,100	90,990	4	4	4	48	48	48
17	21,300	84,378	4	4	4	48	48	48
18	21,400	90,908	4	4	4	48	48	48
19	21,500	90,990	4	4	4	48	48	48
20	21,200	90,945	4	4	4	48	48	48
21	21,100	90,917	4	4	4	48	48	48
22	22,600	90,999	4	4	4	48	48	46
23	22,800	91,027	4	4	4	42	42	40
24	22,600	90,945	4	4	4	43	44	44
25	20,500	90,999	4	4	4	42	42	47
26	23,400	90,963	4	4	4	42	47	44
27	23,400	91,027	4	4	4	48	48	43
28	24,700	90,635	4	4	4	48	48	43
29	24,700	90,945	4	4	4	48	48	42
30	24,800	90,890	4	4	4	48	48	42
31	23,600	90,933	4	4	4	48	48	42
AVERAGE	22,787	90,745	4	4	4	47	47	45

ASSUMPTIONS: Drift Rate = 0.00075%
TDS ppm = 0.75 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM

FOR 1990

CALCULATED TOWER PERFORMANCE PARAMETERS - UNIT 1

DECEMBER DAY	Airflow /Tower. cu m/s Twr 01	Twr 02	Twr 03	Heat BTU/min	Calc TDS, ppm	CW Flow gpm	Calc Drift gpm	lb/min
1	10,128	10,128	9,495	2.16E+08	16,650	589,000	4.325	0.601
2	10,128	10,128	9,495	2.16E+08	16,425	589,000	4.325	0.593
3	10,128	10,128	9,495	2.16E+08	17,550	589,000	4.325	0.633
4	10,128	10,128	9,495	2.16E+08	17,475	589,000	4.325	0.631
5	10,128	10,128	9,495	2.16E+08	16,875	589,000	4.325	0.609
6	10,128	10,128	9,706	2.16E+08	16,875	589,000	4.356	0.613
7	10,128	10,128	10,128	2.16E+08	18,075	589,000	4.418	0.666
8	10,128	10,128	9,706	2.16E+08	17,850	589,000	4.356	0.649
9	10,128	10,128	9,495	2.16E+08	17,625	589,000	4.325	0.636
10	10,128	10,128	9,495	2.16E+08	16,350	589,000	4.325	0.590
11	10,128	10,128	9,495	2.16E+08	16,350	589,000	4.325	0.590
12	10,128	10,128	8,862	2.15E+08	18,000	589,000	4.233	0.636
13	10,128	10,128	9,073	2.15E+08	18,375	589,000	4.264	0.654
14	10,128	10,128	10,128	2.16E+08	16,875	589,000	4.418	0.622
15	10,128	10,128	10,128	2.16E+08	16,425	589,000	4.418	0.605
16	10,128	10,128	10,128	2.16E+08	17,325	589,000	4.418	0.639
17	10,128	10,128	10,128	2.00E+08	15,975	589,000	4.418	0.589
18	10,128	10,128	10,128	2.15E+08	16,050	589,000	4.418	0.592
19	10,128	10,128	10,128	2.16E+08	16,125	589,000	4.418	0.594
20	10,128	10,128	10,128	2.16E+08	15,900	589,000	4.418	0.586
21	10,128	10,128	10,128	2.15E+08	15,825	589,000	4.418	0.583
22	10,128	10,128	9,706	2.16E+08	16,950	589,000	4.356	0.616
23	8,862	8,862	8,440	2.16E+08	17,100	589,000	3.804	0.543
24	9,073	9,284	9,284	2.16E+08	16,950	589,000	4.019	0.568
25	8,862	8,862	9,917	2.16E+08	15,375	589,000	4.019	0.516
26	8,862	9,917	9,284	2.16E+08	17,550	589,000	4.080	0.598
27	10,128	10,128	9,073	2.16E+08	17,550	589,000	4.264	0.624
28	10,128	10,128	9,073	2.15E+08	18,525	589,000	4.264	0.659
29	10,128	10,128	8,862	2.16E+08	18,525	589,000	4.233	0.654
30	10,128	10,128	8,862	2.15E+08	18,600	589,000	4.233	0.657
31	10,128	10,128	8,862	2.00E+08	17,700	589,000	4.233	0.625
AVERAGE	9,971	10,012	9,543	2.15E+08	17,090	589,000	4.293	0.612

ASSUMPTIONS: Drift Rate = 0.00075%

TDS ppm = 0.75 x Conductivity, umhos/cm

Airflow = 64.4 E 06 cfm/ 48 fans

CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1990
INPUT DATA - UNIT 2

JANUARY	DAY	CW CONDUCTIVITY DATA umhos/cm	THERMAL GEN MWt/d	CW FLOW - No PUMPS/SHIFT Mids	Days	Swings	SUM - FANS OPER IN EA SHIFT Twr 01	Twr 02	Twr 03
	1	16,750	90,662	4	4	4	36	45	48
	2	17,500	90,680	4	4	4	36	45	48
	3	17,600	90,680	4	4	4	36	45	48
	4	16,200	90,525	4	4	4	36	45	48
	5	16,050	90,516	4	4	4	39	45	48
	6	16,500	90,534	4	4	4	39	45	48
	7	15,550	90,580	4	4	4	39	45	48
	8	17,450	90,543	4	4	4	39	45	48
	9	17,100	90,480	4	4	4	39	45	48
	10	17,700	90,498	4	4	4	39	45	48
	11	17,600	90,516	4	4	4	39	45	48
	12	17,200	90,543	4	4	4	42	45	48
	13	18,000	90,616	4	4	4	42	45	48
	14	17,000	90,580	4	4	4	42	45	48
	15	18,000	90,370	4	4	4	42	45	48
	16	14,750	90,662	4	4	4	42	45	48
	17	16,850	90,553	4	4	4	45	45	48
	18	16,500	90,644	4	4	4	48	45	48
	19	15,900	90,625	4	4	4	48	45	48
	20	15,450	90,452	4	4	4	48	48	48
	21	15,800	90,607	4	4	4	48	48	48
	22	16,950	90,525	4	4	4	48	48	48
	23	16,350	90,543	4	4	4	48	48	48
	24	16,300	90,635	4	4	4	48	48	48
	25	16,450	90,370	4	4	4	48	48	48
	26	16,350	90,480	4	4	4	48	48	48
	27	16,300	89,814	4	4	4	48	48	48
	28	16,850	90,525	4	4	4	48	48	48
	29	12,475	90,452	4	4	4	48	48	48
	30	15,100	90,461	4	4	4	48	48	48
	31	14,000	90,397	4	4	4	48	48	48
AVERAGE		16,406	90,518	4	4	4	43	46	48

ASSUMPTIONS: Drift Rate = 0.00075%
TDS ppm = 0.95 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1990
CALCULATED TOWER PERFORMANCE PARAMETERS - UNIT 2

JANUARY	DAY	Airflow /Tower. cu m/s Twr 01	Twr 02	Twr 03	Heat BTU/min	Calc TDS, ppm	CW Flow gpm	Calc Drift gpm	lb/min
	1	7,596	9,495	10,128	2.15E+08	15,913	589,000	3.957	0.525
	2	7,596	9,495	10,128	2.15E+08	16,625	589,000	3.957	0.549
	3	7,596	9,495	10,128	2.15E+08	16,720	589,000	3.957	0.552
	4	7,596	9,495	10,128	2.15E+08	15,390	589,000	3.957	0.508
	5	8,229	9,495	10,128	2.15E+08	15,248	589,000	4.049	0.515
	6	8,229	9,495	10,128	2.15E+08	15,675	589,000	4.049	0.530
	7	8,229	9,495	10,128	2.15E+08	14,773	589,000	4.049	0.499
	8	8,229	9,495	10,128	2.15E+08	16,578	589,000	4.049	0.560
	9	8,229	9,495	10,128	2.14E+08	16,245	589,000	4.049	0.549
	10	8,229	9,495	10,128	2.14E+08	16,815	589,000	4.049	0.568
	11	8,229	9,495	10,128	2.15E+08	16,720	589,000	4.049	0.565
	12	8,862	9,495	10,128	2.15E+08	16,340	589,000	4.141	0.565
	13	8,862	9,495	10,128	2.15E+08	17,100	589,000	4.141	0.591
	14	8,862	9,495	10,128	2.15E+08	16,150	589,000	4.141	0.558
	15	8,862	9,495	10,128	2.14E+08	17,100	589,000	4.141	0.591
	16	8,862	9,495	10,128	2.15E+08	14,013	589,000	4.141	0.484
	17	9,495	9,495	10,128	2.15E+08	16,008	589,000	4.233	0.566
	18	10,128	9,495	10,128	2.15E+08	15,675	589,000	4.325	0.566
	19	10,128	9,495	10,128	2.15E+08	15,105	589,000	4.325	0.545
	20	10,128	10,128	10,128	2.14E+08	14,678	589,000	4.418	0.541
	21	10,128	10,128	10,128	2.15E+08	15,010	589,000	4.418	0.553
	22	10,128	10,128	10,128	2.15E+08	16,103	589,000	4.418	0.594
	23	10,128	10,128	10,128	2.15E+08	15,533	589,000	4.418	0.573
	24	10,128	10,128	10,128	2.15E+08	15,485	589,000	4.418	0.571
	25	10,128	10,128	10,128	2.14E+08	15,628	589,000	4.418	0.576
	26	10,128	10,128	10,128	2.14E+08	15,533	589,000	4.418	0.573
	27	10,128	10,128	10,128	2.13E+08	15,485	589,000	4.418	0.571
	28	10,128	10,128	10,128	2.15E+08	16,008	589,000	4.418	0.590
	29	10,128	10,128	10,128	2.14E+08	11,851	589,000	4.418	0.437
	30	10,128	10,128	10,128	2.14E+08	14,345	589,000	4.418	0.529
	31	10,128	10,128	10,128	2.14E+08	13,300	589,000	4.418	0.490
AVERAGE		9,148	9,740	10,128	2.15E+08	15,585	589,000	4.219	0.548

ASSUMPTIONS: Drift Rate = 0.00075%
TDS ppm = 0.95 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1990
INPUT DATA - UNIT 2

FEBRUARY DAY	CW CONDUCTIVITY DATA umhos/cm	THERMAL GEN MWt/d	CW FLOW - No PUMPS/SHIFT Mids	Days	Swings	SUM - FANS OPER IN EA SHIFT Twr 01	Twr 02	Twr 03
1	13,395	90,735	4	4	4	48	48	48
2	17,900	90,489	4	4	4	48	48	48
3	17,450	90,498	4	4	4	48	36	48
4	15,950	90,562	4	4	4	48	48	48
5	14,300	90,662	4	4	4	48	48	48
6	12,950	90,552	4	4	4	48	45	48
7	14,550	90,543	4	4	4	48	48	48
8	13,500	90,562	4	4	4	48	48	48
9	15,750	90,480	4	4	4	48	48	48
10	15,500	90,598	4	4	4	48	48	48
11	15,800	90,480	4	4	4	48	48	48
12	15,300	90,461	4	4	4	48	48	48
13	15,350	90,598	4	4	4	48	48	48
14	15,300	90,598	4	4	4	48	48	48
15	15,100	90,534	4	4	4	36	48	48
16	12,775	90,753	4	4	4	18	48	48
17	15,950	90,680	4	4	4	45	48	48
18	14,705	90,489	4	4	4	45	48	48
19	16,500	90,434	4	4	4	45	48	48
20	15,150	90,334	4	4	4	45	48	48
21	16,450	90,461	4	4	4	45	48	48
22	16,150	89,558	4	4	4	45	48	48
23	12,800	73,571	4	4	4	45	48	48
24	12,550	0	2	2	2	0	0	0
25	14,050	0	0	0	0	0	0	0
26	14,050	0	0	0	0	0	0	0
27	14,150	0	0	0	0	0	0	0
28	14,250	0	0	0	0	0	0	0
AVERAGE	14,915	73,737	3	3	3	37	39	39

ASSUMPTIONS: Drift Rate = 0.00075%
TDS ppm = 0.86 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1990
CALCULATED TOWER PERFORMANCE PARAMETERS - UNIT 2

	Airflow /Tower. cu m/s			Heat	Calc	CW Flow	Calc Drift	
FEBRUARY DAY	Twr 01	Twr 02	Twr 03	BTU/min	TDS, ppm	gpm	gpm	lb/min
1	10,128	10,128	10,128	2.15E+08	11,520	589,000	4.418	0.425
2	10,128	10,128	10,128	2.14E+08	15,394	589,000	4.418	0.567
3	10,128	7,596	10,128	2.14E+08	15,007	589,000	4.049	0.507
4	10,128	10,128	10,128	2.15E+08	13,717	589,000	4.418	0.506
5	10,128	10,128	10,128	2.15E+08	12,298	589,000	4.418	0.453
6	10,128	9,495	10,128	2.15E+08	11,137	589,000	4.325	0.402
7	10,128	10,128	10,128	2.15E+08	12,513	589,000	4.418	0.461
8	10,128	10,128	10,128	2.15E+08	11,610	589,000	4.418	0.428
9	10,128	10,128	10,128	2.14E+08	13,545	589,000	4.418	0.499
10	10,128	10,128	10,128	2.15E+08	13,330	589,000	4.418	0.491
11	10,128	10,128	10,128	2.14E+08	13,588	589,000	4.418	0.501
12	10,128	10,128	10,128	2.14E+08	13,158	589,000	4.418	0.485
13	10,128	10,128	10,128	2.15E+08	13,201	589,000	4.418	0.487
14	10,128	10,128	10,128	2.15E+08	13,158	589,000	4.418	0.485
15	7,596	10,128	10,128	2.15E+08	12,986	589,000	4.049	0.439
16	3,798	10,128	10,128	2.15E+08	10,987	589,000	3.497	0.321
17	9,495	10,128	10,128	2.15E+08	13,717	589,000	4.325	0.495
18	9,495	10,128	10,128	2.14E+08	12,646	589,000	4.325	0.456
19	9,495	10,128	10,128	2.14E+08	14,190	589,000	4.325	0.512
20	9,495	10,128	10,128	2.14E+08	13,029	589,000	4.325	0.470
21	9,495	10,128	10,128	2.14E+08	14,147	589,000	4.325	0.511
22	9,495	10,128	10,128	2.12E+08	13,889	589,000	4.325	0.501
23	9,495	10,128	10,128	1.74E+08	11,008	589,000	4.325	0.397
24	0	0	0	0.00E+00	10,793	309,000	0.000	0.000
25	0	0	0	0.00E+00	12,083	29,000	0.000	0.000
26	0	0	0	0.00E+00	12,083	29,000	0.000	0.000
27	0	0	0	0.00E+00	12,169	29,000	0.000	0.000
28	0	0	0	0.00E+00	12,255	29,000	0.000	0.000
AVERAGE	7,845	8,206	8,319	1.75E+08	12,827	499,000	3.543	0.386

ASSUMPTIONS: Drift Rate = 0.00075%
TDS ppm = 0.86 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1990
INPUT DATA - UNIT 2

MARCH	DAY	CW CONDUCTIVITY DATA umhos/cm	THERMAL GEN MWt/d	CW FLOW - No PUMPS/SHIFT Mids	Days	Swings	SUM - FANS OPER IN EA SHIFT Twr 01	Twr 02	Twr 03
	1	0	0	0	0	0	0	0	0
	2	0	0	0	0	0	0	0	0
	3	0	0	0	0	0	0	0	0
	4	0	0	0	0	0	0	0	0
	5	0	0	0	0	0	0	0	0
	6	0	0	0	0	0	0	0	0
	7	0	0	0	0	0	0	0	0
	8	0	0	0	0	0	0	0	0
	9	0	0	0	0	0	0	0	0
	10	0	0	0	0	0	0	0	0
	11	0	0	0	0	0	0	0	0
	12	0	0	0	0	0	0	0	0
	13	0	0	0	0	0	0	0	0
	14	0	0	0	0	0	0	0	0
	15	0	0	0	0	0	0	0	0
	16	0	0	0	0	0	0	0	0
	17	0	0	0	0	0	0	0	0
	18	0	0	0	0	0	0	0	0
	19	0	0	0	0	0	0	0	0
	20	0	0	0	0	0	0	0	0
	21	0	0	0	0	0	0	0	0
	22	0	0	0	0	0	0	0	0
	23	0	0	0	0	0	0	0	0
	24	0	0	0	0	0	0	0	0
	25	0	0	0	0	0	0	0	0
	26	0	0	0	0	0	0	0	0
	27	0	0	0	0	0	0	0	0
	28	0	0	0	0	0	0	0	0
	29	0	0	0	0	0	0	0	0
	30	0	0	0	0	0	0	0	0
	31	0	0	0	0	0	0	0	0
AVERAGE		0	0	0	0	0	0	0	0

ASSUMPTIONS: Drift Rate = 0.00075%
TDS ppm = 0.79 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1990
CALCULATED TOWER PERFORMANCE PARAMETERS - UNIT 2

		Airflow /Tower. cu m/s			Heat	Calc	CW Flow	Calc Drift	
MARCH	DAY	Twr 01	Twr 02	Twr 03	BTU/min	TDS, ppm	gpm	gpm	lb/min
	1	0	0	0	0.00E+00	0	29,000	0.000	0.000
	2	0	0	0	0.00E+00	0	29,000	0.000	0.000
	3	0	0	0	0.00E+00	0	29,000	0.000	0.000
	4	0	0	0	0.00E+00	0	29,000	0.000	0.000
	5	0	0	0	0.00E+00	0	29,000	0.000	0.000
	6	0	0	0	0.00E+00	0	29,000	0.000	0.000
	7	0	0	0	0.00E+00	0	29,000	0.000	0.000
	8	0	0	0	0.00E+00	0	29,000	0.000	0.000
	9	0	0	0	0.00E+00	0	29,000	0.000	0.000
	10	0	0	0	0.00E+00	0	29,000	0.000	0.000
	11	0	0	0	0.00E+00	0	29,000	0.000	0.000
	12	0	0	0	0.00E+00	0	29,000	0.000	0.000
	13	0	0	0	0.00E+00	0	29,000	0.000	0.000
	14	0	0	0	0.00E+00	0	29,000	0.000	0.000
	15	0	0	0	0.00E+00	0	29,000	0.000	0.000
	16	0	0	0	0.00E+00	0	29,000	0.000	0.000
	17	0	0	0	0.00E+00	0	29,000	0.000	0.000
	18	0	0	0	0.00E+00	0	29,000	0.000	0.000
	19	0	0	0	0.00E+00	0	29,000	0.000	0.000
	20	0	0	0	0.00E+00	0	29,000	0.000	0.000
	21	0	0	0	0.00E+00	0	29,000	0.000	0.000
	22	0	0	0	0.00E+00	0	29,000	0.000	0.000
	23	0	0	0	0.00E+00	0	29,000	0.000	0.000
	24	0	0	0	0.00E+00	0	29,000	0.000	0.000
	25	0	0	0	0.00E+00	0	29,000	0.000	0.000
	26	0	0	0	0.00E+00	0	29,000	0.000	0.000
	27	0	0	0	0.00E+00	0	29,000	0.000	0.000
	28	0	0	0	0.00E+00	0	29,000	0.000	0.000
	29	0	0	0	0.00E+00	0	29,000	0.000	0.000
	30	0	0	0	0.00E+00	0	29,000	0.000	0.000
	31	0	0	0	0.00E+00	0	29,000	0.000	0.000
AVERAGE		0	0	0	0.00E+00	0	29,000	0.000	0.000

ASSUMPTIONS: Drift Rate = 0.00075%
TDS ppm = 0.79 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1990
INPUT DATA - UNIT 2

APRIL	DAY	CW CONDUCTIVITY DATA umhos/cm	THERMAL GEN MWt/d	CW FLOW - No PUMPS/SHIFT Mids	Days	Swings	SUM - FANS OPER IN EA SHIFT Twr 01	Twr 02	Twr 03
	1	0	0	0	0	0	0	0	0
	2	0	0	0	0	0	0	0	0
	3	0	0	0	0	0	0	0	0
	4	0	0	0	0	0	0	0	0
	5	0	0	0	0	0	0	0	0
	6	0	0	0	0	0	0	0	0
	7	0	0	0	0	0	0	0	0
	8	0	0	0	0	0	0	0	0
	9	0	0	0	0	0	0	0	0
	10	0	0	0	0	0	0	0	0
	11	0	0	0	0	0	0	0	0
	12	0	0	0	0	0	0	0	0
	13	0	0	0	0	0	0	0	0
	14	0	0	0	0	0	0	0	0
	15	0	0	0	0	0	0	0	0
	16	0	0	0	0	0	0	0	0
	17	0	0	0	0	0	0	0	0
	18	0	0	0	0	0	0	0	0
	19	0	0	0	0	0	0	0	0
	20	0	0	0	0	0	0	0	0
	21	0	0	0	0	0	0	0	0
	22	0	0	0	0	0	0	0	0
	23	0	0	0	0	0	0	0	0
	24	0	0	0	0	0	0	0	0
	25	0	0	0	0	0	0	0	0
	26	0	0	0	0	0	0	0	0
	27	0	0	0	0	0	0	0	0
	28	0	0	0	0	0	0	0	0
	29	0	0	0	0	0	0	0	0
	30	0	0	0	0	0	0	0	0
AVERAGE		0	0	0	0	0	0	0	0

ASSUMPTIONS: Drift Rate = 0.00075%
TDS ppm = 0.79 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1990
CALCULATED TOWER PERFORMANCE PARAMETERS - UNIT 2

APRIL	DAY	Airflow /Tower. cu m/s Twr 01	Twr 02	Twr 03	Heat BTU/min	Calc TDS, ppm	CW Flow gpm	Calc Drift gpm	lb/min
	1	0	0	0	0.00E+00	0	29,000	0.000	0.000
	2	0	0	0	0.00E+00	0	29,000	0.000	0.000
	3	0	0	0	0.00E+00	0	29,000	0.000	0.000
	4	0	0	0	0.00E+00	0	29,000	0.000	0.000
	5	0	0	0	0.00E+00	0	29,000	0.000	0.000
	6	0	0	0	0.00E+00	0	29,000	0.000	0.000
	7	0	0	0	0.00E+00	0	29,000	0.000	0.000
	8	0	0	0	0.00E+00	0	29,000	0.000	0.000
	9	0	0	0	0.00E+00	0	29,000	0.000	0.000
	10	0	0	0	0.00E+00	0	29,000	0.000	0.000
	11	0	0	0	0.00E+00	0	29,000	0.000	0.000
	12	0	0	0	0.00E+00	0	29,000	0.000	0.000
	13	0	0	0	0.00E+00	0	29,000	0.000	0.000
	14	0	0	0	0.00E+00	0	29,000	0.000	0.000
	15	0	0	0	0.00E+00	0	29,000	0.000	0.000
	16	0	0	0	0.00E+00	0	29,000	0.000	0.000
	17	0	0	0	0.00E+00	0	29,000	0.000	0.000
	18	0	0	0	0.00E+00	0	29,000	0.000	0.000
	19	0	0	0	0.00E+00	0	29,000	0.000	0.000
	20	0	0	0	0.00E+00	0	29,000	0.000	0.000
	21	0	0	0	0.00E+00	0	29,000	0.000	0.000
	22	0	0	0	0.00E+00	0	29,000	0.000	0.000
	23	0	0	0	0.00E+00	0	29,000	0.000	0.000
	24	0	0	0	0.00E+00	0	29,000	0.000	0.000
	25	0	0	0	0.00E+00	0	29,000	0.000	0.000
	26	0	0	0	0.00E+00	0	29,000	0.000	0.000
	27	0	0	0	0.00E+00	0	29,000	0.000	0.000
	28	0	0	0	0.00E+00	0	29,000	0.000	0.000
	29	0	0	0	0.00E+00	0	29,000	0.000	0.000
	30	0	0	0	0.00E+00	0	29,000	0.000	0.000
AVERAGE		0	0	0	0.00E+00	0	29,000	0.000	0.000

ASSUMPTIONS: Drift Rate = 0.00075%
TDS ppm = 0.79 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1990
INPUT DATA - UNIT 2

MAY	DAY	CW CONDUCTIVITY DATA umhos/cm	THERMAL GEN MWt/d	CW FLOW - No PUMPS/SHIFT Mids	Days	Swings	SUM - FANS OPER IN EA SHIFT Twr 01	Twr 02	Twr 03
	1	0	0	0	0	0	0	0	0
	2	0	0	0	0	0	0	0	0
	3	0	0	0	0	0	0	0	0
	4	0	0	0	0	0	0	0	0
	5	0	0	0	0	0	0	0	0
	6	0	0	0	0	0	0	0	0
	7	0	0	0	0	0	0	0	0
	8	0	0	0	0	0	0	0	0
	9	0	0	0	0	0	0	0	0
	10	0	0	0	0	0	0	0	0
	11	0	0	0	0	0	0	0	0
	12	0	0	0	0	0	0	0	0
	13	0	0	0	0	0	0	0	0
	14	0	0	0	0	0	0	0	0
	15	0	0	0	0	0	0	0	0
	16	0	0	0	0	0	0	0	0
	17	0	0	0	0	0	0	0	0
	18	0	0	0	0	0	0	0	0
	19	0	0	0	0	0	0	0	0
	20	0	0	0	0	0	0	0	0
	21	0	0	0	0	0	0	0	0
	22	0	0	0	0	0	0	0	0
	23	0	0	0	0	0	0	0	0
	24	0	0	0	0	0	0	0	0
	25	0	0	0	0	0	0	0	0
	26	0	0	0	0	0	0	0	0
	27	0	0	0	0	0	0	0	0
	28	0	0	0	0	0	0	0	0
	29	0	0	0	0	0	0	0	0
	30	0	0	0	0	0	0	0	0
	31	0	0	0	0	0	0	0	0
AVERAGE		0	0	0	0	0	0	0	0

ASSUMPTIONS: Drift Rate = 0.00075%
TDS ppm = 0.79 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1990
CALCULATED TOWER PERFORMANCE PARAMETERS - UNIT 2

		Airflow /Tower. cu m/s			Heat	Calc	CW Flow	Calc Drift	
MAY	DAY	Twr 01	Twr 02	Twr 03	BTU/min	TDS, ppm	gpm	gpm	lb/min
	1	0	0	0	0.00E+00	0	29,000	0.000	0.000
	2	0	0	0	0.00E+00	0	29,000	0.000	0.000
	3	0	0	0	0.00E+00	0	29,000	0.000	0.000
	4	0	0	0	0.00E+00	0	29,000	0.000	0.000
	5	0	0	0	0.00E+00	0	29,000	0.000	0.000
	6	0	0	0	0.00E+00	0	29,000	0.000	0.000
	7	0	0	0	0.00E+00	0	29,000	0.000	0.000
	8	0	0	0	0.00E+00	0	29,000	0.000	0.000
	9	0	0	0	0.00E+00	0	29,000	0.000	0.000
	10	0	0	0	0.00E+00	0	29,000	0.000	0.000
	11	0	0	0	0.00E+00	0	29,000	0.000	0.000
	12	0	0	0	0.00E+00	0	29,000	0.000	0.000
	13	0	0	0	0.00E+00	0	29,000	0.000	0.000
	14	0	0	0	0.00E+00	0	29,000	0.000	0.000
	15	0	0	0	0.00E+00	0	29,000	0.000	0.000
	16	0	0	0	0.00E+00	0	29,000	0.000	0.000
	17	0	0	0	0.00E+00	0	29,000	0.000	0.000
	18	0	0	0	0.00E+00	0	29,000	0.000	0.000
	19	0	0	0	0.00E+00	0	29,000	0.000	0.000
	20	0	0	0	0.00E+00	0	29,000	0.000	0.000
	21	0	0	0	0.00E+00	0	29,000	0.000	0.000
	22	0	0	0	0.00E+00	0	29,000	0.000	0.000
	23	0	0	0	0.00E+00	0	29,000	0.000	0.000
	24	0	0	0	0.00E+00	0	29,000	0.000	0.000
	25	0	0	0	0.00E+00	0	29,000	0.000	0.000
	26	0	0	0	0.00E+00	0	29,000	0.000	0.000
	27	0	0	0	0.00E+00	0	29,000	0.000	0.000
	28	0	0	0	0.00E+00	0	29,000	0.000	0.000
	29	0	0	0	0.00E+00	0	29,000	0.000	0.000
	30	0	0	0	0.00E+00	0	29,000	0.000	0.000
	31	0	0	0	0.00E+00	0	29,000	0.000	0.000
AVERAGE		0	0	0	0.00E+00	0	29,000	0.000	0.000

ASSUMPTIONS: Drift Rate = 0.00075%
TDS ppm = 0.79 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1990
INPUT DATA - UNIT 2

JUNE	DAY	CW CONDUCTIVITY DATA umhos/cm	THERMAL GEN MWt/d	CW FLOW - No PUMPS/SHIFT Mids	Days	Swings	SUM - FANS OPER IN EA SHIFT Twr 01	Twr 02	Twr 03
	1	0	0	0	0	0	0	0	0
	2	0	0	0	0	0	0	0	0
	3	0	0	0	0	0	0	0	0
	4	0	0	0	0	0	0	0	0
	5	0	0	0	0	0	0	0	0
	6	0	0	0	0	0	0	0	0
	7	0	0	0	0	0	0	0	0
	8	0	0	0	0	0	0	0	0
	9	0	0	0	0	0	0	0	0
	10	0	0	0	0	0	0	0	0
	11	0	0	0	0	0	0	0	0
	12	0	0	0	0	0	0	0	0
	13	0	0	0	0	0	0	0	0
	14	0	0	0	0	0	0	0	0
	15	0	0	0	0	0	0	0	0
	16	0	0	0	0	0	0	0	0
	17	0	0	0	0	0	0	0	0
	18	0	0	0	0	0	0	0	0
	19	0	0	0	0	0	0	0	0
	20	0	0	0	0	0	0	0	0
	21	0	0	0	0	0	0	0	0
	22	0	0	0	0	0	0	0	0
	23	0	0	0	0	0	0	0	0
	24	0	0	0	0	0	0	0	0
	25	0	0	0	0	0	0	0	0
	26	0	0	0	0	0	0	0	0
	27	0	0	0	0	0	0	0	0
	28	0	0	0	0	0	0	0	0
	29	0	0	0	0	0	0	0	0
	30	0	0	0	0	0	0	0	0
AVERAGE		0	0	0	0	0	0	0	0

ASSUMPTIONS: Drift Rate = 0.00075%
TDS ppm = 0.79 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1990
CALCULATED TOWER PERFORMANCE PARAMETERS - UNIT 2

		Airflow /Tower. cu m/s			Heat	Calc	CW Flow	Calc Drift	
JUNE	DAY	Twr 01	Twr 02	Twr 03	BTU/min	TDS, ppm	gpm	gpm	lb/min
	1	0	0	0	0.00E+00	0	29,000	0.000	0.000
	2	0	0	0	0.00E+00	0	29,000	0.000	0.000
	3	0	0	0	0.00E+00	0	29,000	0.000	0.000
	4	0	0	0	0.00E+00	0	29,000	0.000	0.000
	5	0	0	0	0.00E+00	0	29,000	0.000	0.000
	6	0	0	0	0.00E+00	0	29,000	0.000	0.000
	7	0	0	0	0.00E+00	0	29,000	0.000	0.000
	8	0	0	0	0.00E+00	0	29,000	0.000	0.000
	9	0	0	0	0.00E+00	0	29,000	0.000	0.000
	10	0	0	0	0.00E+00	0	29,000	0.000	0.000
	11	0	0	0	0.00E+00	0	29,000	0.000	0.000
	12	0	0	0	0.00E+00	0	29,000	0.000	0.000
	13	0	0	0	0.00E+00	0	29,000	0.000	0.000
	14	0	0	0	0.00E+00	0	29,000	0.000	0.000
	15	0	0	0	0.00E+00	0	29,000	0.000	0.000
	16	0	0	0	0.00E+00	0	29,000	0.000	0.000
	17	0	0	0	0.00E+00	0	29,000	0.000	0.000
	18	0	0	0	0.00E+00	0	29,000	0.000	0.000
	19	0	0	0	0.00E+00	0	29,000	0.000	0.000
	20	0	0	0	0.00E+00	0	29,000	0.000	0.000
	21	0	0	0	0.00E+00	0	29,000	0.000	0.000
	22	0	0	0	0.00E+00	0	29,000	0.000	0.000
	23	0	0	0	0.00E+00	0	29,000	0.000	0.000
	24	0	0	0	0.00E+00	0	29,000	0.000	0.000
	25	0	0	0	0.00E+00	0	29,000	0.000	0.000
	26	0	0	0	0.00E+00	0	29,000	0.000	0.000
	27	0	0	0	0.00E+00	0	29,000	0.000	0.000
	28	0	0	0	0.00E+00	0	29,000	0.000	0.000
	29	0	0	0	0.00E+00	0	29,000	0.000	0.000
	30	0	0	0	0.00E+00	0	29,000	0.000	0.000
AVERAGE		0	0	0	0.00E+00	0	29,000	0.000	0.000

ASSUMPTIONS: Drift Rate = 0.00075%
TDS ppm = 0.79 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1990
INPUT DATA - UNIT 2

JULY	DAY	CW CONDUCTIVITY DATA umhos/cm	THERMAL GEN MWt/d	CW FLOW - No PUMPS/SHIFT Mids	Days	Swings	SUM - FANS OPER IN EA SHIFT Twr 01	Twr 02	Twr 03
	1	8,105	0	0	0	0	0	0	0
	2	8,025	0	0	0	0	0	0	0
	3	8,005	0	2	2	2	0	0	0
	4	8,000	0	2	2	2	0	0	0
	5	8,085	0	2	2	2	0	0	0
	6	8,640	0	2	2	2	2	0	0
	7	8,225	0	2	2	2	3	0	1
	8	8,255	0	2	2	2	3	0	3
	9	8,635	0	2	2	2	1	0	0
	10	8,770	0	2	2	2	0	0	0
	11	8,900	0	2	2	2	0	0	0
	12	9,090	0	2	2	2	2	0	0
	13	8,855	0	2	2	2	9	0	0
	14	9,055	0	2	2	2	8	0	0
	15	9,175	0	2	2	2	0	0	0
	16	9,455	0	2	2	2	0	0	0
	17	9,645	192	2	2	2	0	0	0
	18	9,550	7,205	2	2	2	8	0	9
	19	9,480	14,045	2	2	2	18	0	27
	20	9,530	17,693	2	2	2	18	0	27
	21	11,055	17,146	2	2	2	18	0	28
	22	11,835	35,212	2	2	3	38	5	40
	23	12,450	58,833	3	3	4	48	30	45
	24	14,400	63,083	4	4	4	48	0	45
	25	16,200	62,135	4	4	4	48	0	45
	26	17,800	60,447	4	4	4	48	7	41
	27	19,250	60,073	4	4	4	48	39	45
	28	20,250	50,279	4	4	3	48	39	45
	29	20,950	37,201	2	2	2	45	39	45
	30	20,950	37,538	2	2	2	45	36	45
	31	20,650	37,720	2	2	2	45	36	45
AVERAGE		11,654	18,026	2	2	2	18	7	17

ASSUMPTIONS: Drift Rate = 0.00075%
TDS ppm = 0.60 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1990
CALCULATED TOWER PERFORMANCE PARAMETERS - UNIT 2

		Airflow /Tower. cu m/s			Heat	Calc	CW Flow	Calc Drift	
JULY	DAY	Twr 01	Twr 02	Twr 03	BTU/min	TDS, ppm	gpm	gpm	lb/min
	1	0	0	0	0.00E+00	4,863	29,000	0.000	0.000
	2	0	0	0	0.00E+00	4,815	29,000	0.000	0.000
	3	0	0	0	0.00E+00	4,803	309,000	0.000	0.000
	4	0	0	0	0.00E+00	4,800	309,000	0.000	0.000
	5	0	0	0	0.00E+00	4,851	309,000	0.000	0.000
	6	422	0	0	0.00E+00	5,184	309,000	0.032	0.001
	7	633	0	211	0.00E+00	4,935	309,000	0.064	0.003
	8	633	0	633	0.00E+00	4,953	309,000	0.097	0.004
	9	211	0	0	0.00E+00	5,181	309,000	0.016	0.001
	10	0	0	0	0.00E+00	5,262	309,000	0.000	0.000
	11	0	0	0	0.00E+00	5,340	309,000	0.000	0.000
	12	422	0	0	0.00E+00	5,454	309,000	0.032	0.001
	13	1,899	0	0	0.00E+00	5,313	309,000	0.145	0.006
	14	1,688	0	0	0.00E+00	5,433	309,000	0.129	0.006
	15	0	0	0	0.00E+00	5,505	309,000	0.000	0.000
	16	0	0	0	0.00E+00	5,673	309,000	0.000	0.000
	17	0	0	0	4.55E+05	5,787	309,000	0.000	0.000
	18	1,688	0	1,899	1.71E+07	5,730	309,000	0.274	0.013
	19	3,798	0	5,697	3.33E+07	5,688	309,000	0.724	0.034
	20	3,798	0	5,697	4.19E+07	5,718	309,000	0.724	0.035
	21	3,798	0	5,908	4.06E+07	6,633	309,000	0.740	0.041
	22	8,018	1,055	8,440	8.35E+07	7,101	355,667	1.538	0.091
	23	10,128	6,330	9,495	1.39E+08	7,470	495,667	3.175	0.198
	24	10,128	0	9,495	1.50E+08	8,640	589,000	2.853	0.206
	25	10,128	0	9,495	1.47E+08	9,720	589,000	2.853	0.231
	26	10,128	1,477	8,651	1.43E+08	10,680	589,000	2.945	0.262
	27	10,128	8,229	9,495	1.42E+08	11,550	589,000	4.049	0.390
	28	10,128	8,229	9,495	1.19E+08	12,150	542,333	3.729	0.378
	29	9,495	8,229	9,495	8.82E+07	12,570	309,000	2.076	0.218
	30	9,495	7,596	9,495	8.90E+07	12,570	309,000	2.028	0.213
	31	9,495	7,596	9,495	8.94E+07	12,390	309,000	2.028	0.210
AVERAGE		3,750	1,572	3,648	4.27E+07	6,992	342,118	0.976	0.082

ASSUMPTIONS: Drift Rate = 0.00075%
TDS ppm = 0.60 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1990
INPUT DATA - UNIT 2

AUGUST	DAY	CW CONDUCTIVITY DATA umhos/cm	THERMAL GEN MWt/d	CW FLOW - No PUMPS/SHIFT Mids	Days	Swings	SUM - FANS OPER IN EA SHIFT Twr 01	Twr 02	Twr 03
	1	20,050	37,638	2	2	2	45	37	45
	2	19,650	37,684	2	2	2	44	42	44
	3	18,650	63,867	2	4	4	45	43	45
	4	19,650	89,832	4	4	4	45	45	45
	5	20,650	90,799	4	4	4	45	43	45
	6	21,850	90,233	4	4	4	45	42	45
	7	23,250	90,252	4	4	4	45	43	46
	8	23,650	90,726	4	4	4	45	45	48
	9	24,350	90,698	4	4	4	45	44	48
	10	24,950	90,644	4	4	4	45	45	48
	11	25,150	88,181	4	4	4	45	45	48
	12	26,300	90,762	4	4	4	45	45	48
	13	25,700	90,771	4	4	4	43	45	48
	14	27,050	88,108	4	4	4	42	45	40
	15	27,250	79,025	4	4	4	45	45	0
	16	28,000	87,981	4	4	4	47	46	32
	17	27,600	90,844	4	4	4	48	48	48
	18	27,600	90,972	4	4	4	48	48	48
	19	28,850	90,981	4	4	4	48	48	48
	20	29,200	91,081	4	4	4	48	48	48
	21	28,400	91,036	4	4	4	48	48	48
	22	29,000	90,124	4	4	4	48	48	48
	23	28,600	90,835	4	4	4	48	48	48
	24	26,900	90,954	4	4	4	48	48	48
	25	25,750	89,732	4	4	4	48	48	48
	26	25,800	90,972	4	4	4	48	48	48
	27	25,600	91,018	4	4	4	48	48	48
	28	26,050	91,036	4	4	4	48	48	48
	29	24,650	91,081	4	4	4	48	48	48
	30	25,350	90,835	4	4	4	48	48	48
	31	24,850	90,717	4	4	4	48	48	48
AVERAGE		25,173	85,788	4	4	4	46	46	45

ASSUMPTIONS: Drift Rate = 0.00075%
TDS ppm = 0.93 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM

FOR 1990

CALCULATED TOWER PERFORMANCE PARAMETERS - UNIT 2

AUGUST	DAY	Airflow /Tower. cu m/s Twr 01	Twr 02	Twr 03	Heat BTU/min	Calc TDS, ppm	CW Flow gpm	Calc Drift gpm	lb/min
	1	9,495	7,807	9,495	8.92E+07	18,647	309,000	2.044	0.318
	2	9,284	8,862	9,284	8.93E+07	18,275	309,000	2.092	0.319
	3	9,495	9,073	9,495	1.51E+08	17,345	495,667	3.434	0.497
	4	9,495	9,495	9,495	2.13E+08	18,275	589,000	4.141	0.632
	5	9,495	9,073	9,495	2.15E+08	19,205	589,000	4.080	0.654
	6	9,495	8,862	9,495	2.14E+08	20,321	589,000	4.049	0.687
	7	9,495	9,073	9,706	2.14E+08	21,623	589,000	4.111	0.742
	8	9,495	9,495	10,128	2.15E+08	21,995	589,000	4.233	0.777
	9	9,495	9,284	10,128	2.15E+08	22,646	589,000	4.203	0.794
	10	9,495	9,495	10,128	2.15E+08	23,204	589,000	4.233	0.820
	11	9,495	9,495	10,128	2.09E+08	23,390	589,000	4.233	0.826
	12	9,495	9,495	10,128	2.15E+08	24,459	589,000	4.233	0.864
	13	9,073	9,495	10,128	2.15E+08	23,901	589,000	4.172	0.832
	14	8,862	9,495	8,440	2.09E+08	25,157	589,000	3.896	0.818
	15	9,495	9,495	0	1.87E+08	25,343	589,000	2.761	0.584
	16	9,917	9,706	6,752	2.09E+08	26,040	589,000	3.835	0.833
	17	10,128	10,128	10,128	2.15E+08	25,668	589,000	4.418	0.946
	18	10,128	10,128	10,128	2.16E+08	25,668	589,000	4.418	0.946
	19	10,128	10,128	10,128	2.16E+08	26,831	589,000	4.418	0.989
	20	10,128	10,128	10,128	2.16E+08	27,156	589,000	4.418	1.001
	21	10,128	10,128	10,128	2.16E+08	26,412	589,000	4.418	0.974
	22	10,128	10,128	10,128	2.14E+08	26,970	589,000	4.418	0.994
	23	10,128	10,128	10,128	2.15E+08	26,598	589,000	4.418	0.981
	24	10,128	10,128	10,128	2.16E+08	25,017	589,000	4.418	0.922
	25	10,128	10,128	10,128	2.13E+08	23,948	589,000	4.418	0.883
	26	10,128	10,128	10,128	2.16E+08	23,994	589,000	4.418	0.885
	27	10,128	10,128	10,128	2.16E+08	23,808	589,000	4.418	0.878
	28	10,128	10,128	10,128	2.16E+08	24,227	589,000	4.418	0.893
	29	10,128	10,128	10,128	2.16E+08	22,925	589,000	4.418	0.845
	30	10,128	10,128	10,128	2.15E+08	23,576	589,000	4.418	0.869
	31	10,128	10,128	10,128	2.15E+08	23,111	589,000	4.418	0.852
AVERAGE		9,774	9,665	9,495	2.03E+08	23,411	567,925	4.065	0.802

ASSUMPTIONS: Drift Rate = 0.00075%

TDS ppm = 0.93 x Conductivity, umhos/cm

Airflow = 64.4 E 06 cfm/ 48 fans

CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1990
INPUT DATA - UNIT 2

SEPTEMBER DAY	CW CONDUCTIVITY DATA umhos/cm	THERMAL GEN MWt/d	CW FLOW - No PUMPS/SHIFT Mids	Days	Swings	SUM - FANS OPER IN EA SHIFT Twr 01	Twr 02	Twr 03
1	25,250	90,708	4	4	4	48	48	48
2	26,050	90,698	4	4	4	48	48	48
3	25,450	90,708	4	4	4	48	48	48
4	25,900	90,853	4	4	4	48	48	48
5	25,850	90,963	4	4	4	48	48	48
6	25,900	90,844	4	4	4	48	48	48
7	25,550	90,863	4	4	4	48	48	48
8	28,250	90,708	4	4	4	48	48	48
9	28,650	90,571	4	4	4	48	48	48
10	28,650	90,799	4	4	4	48	48	48
11	28,550	90,945	4	4	4	48	48	48
12	28,900	90,908	4	4	4	48	48	48
13	28,750	90,972	4	4	4	48	48	48
14	27,950	90,981	4	4	4	48	48	48
15	28,750	90,936	4	4	4	48	48	48
16	26,950	90,844	4	4	4	48	48	48
17	26,500	90,790	4	4	4	48	48	48
18	27,550	90,835	4	4	4	48	48	48
19	27,250	90,808	4	4	4	48	48	48
20	28,400	90,735	4	4	4	48	48	48
21	28,650	90,899	4	4	4	48	48	48
22	28,350	90,853	4	4	4	48	48	48
23	29,200	90,835	4	4	4	48	48	48
24	29,000	90,844	4	4	4	48	48	48
25	28,600	90,844	4	4	4	48	48	48
26	28,250	90,817	4	4	4	48	48	48
27	28,050	90,835	4	4	4	48	48	48
28	27,950	90,817	4	4	4	48	48	48
29	28,000	90,689	4	4	4	48	48	48
30	28,050	90,863	4	4	4	48	48	48
AVERAGE	27,638	90,826	4	4	4	48	48	48

ASSUMPTIONS: Drift Rate = 0.00075%
TDS ppm = 0.70 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1990
CALCULATED TOWER PERFORMANCE PARAMETERS - UNIT 2

	Airflow /Tower. cu m/s			Heat	Calc	CW Flow	Calc Drift	
SEPTEMBER DAY	Twr 01	Twr 02	Twr 03	BTU/min	TDS, ppm	gpm	gpm	lb/min
1	10,128	10,128	10,128	2.15E+08	17,675	589,000	4.418	0.652
2	10,128	10,128	10,128	2.15E+08	18,235	589,000	4.418	0.672
3	10,128	10,128	10,128	2.15E+08	17,815	589,000	4.418	0.657
4	10,128	10,128	10,128	2.15E+08	18,130	589,000	4.418	0.668
5	10,128	10,128	10,128	2.16E+08	18,095	589,000	4.418	0.667
6	10,128	10,128	10,128	2.15E+08	18,130	589,000	4.418	0.668
7	10,128	10,128	10,128	2.15E+08	17,885	589,000	4.418	0.659
8	10,128	10,128	10,128	2.15E+08	19,775	589,000	4.418	0.729
9	10,128	10,128	10,128	2.15E+08	20,055	589,000	4.418	0.739
10	10,128	10,128	10,128	2.15E+08	20,055	589,000	4.418	0.739
11	10,128	10,128	10,128	2.16E+08	19,985	589,000	4.418	0.737
12	10,128	10,128	10,128	2.15E+08	20,230	589,000	4.418	0.746
13	10,128	10,128	10,128	2.16E+08	20,125	589,000	4.418	0.742
14	10,128	10,128	10,128	2.16E+08	19,565	589,000	4.418	0.721
15	10,128	10,128	10,128	2.16E+08	20,125	589,000	4.418	0.742
16	10,128	10,128	10,128	2.15E+08	18,865	589,000	4.418	0.695
17	10,128	10,128	10,128	2.15E+08	18,550	589,000	4.418	0.684
18	10,128	10,128	10,128	2.15E+08	19,285	589,000	4.418	0.711
19	10,128	10,128	10,128	2.15E+08	19,075	589,000	4.418	0.703
20	10,128	10,128	10,128	2.15E+08	19,880	589,000	4.418	0.733
21	10,128	10,128	10,128	2.15E+08	20,055	589,000	4.418	0.739
22	10,128	10,128	10,128	2.15E+08	19,845	589,000	4.418	0.732
23	10,128	10,128	10,128	2.15E+08	20,440	589,000	4.418	0.754
24	10,128	10,128	10,128	2.15E+08	20,300	589,000	4.418	0.748
25	10,128	10,128	10,128	2.15E+08	20,020	589,000	4.418	0.738
26	10,128	10,128	10,128	2.15E+08	19,775	589,000	4.418	0.729
27	10,128	10,128	10,128	2.15E+08	19,635	589,000	4.418	0.724
28	10,128	10,128	10,128	2.15E+08	19,565	589,000	4.418	0.721
29	10,128	10,128	10,128	2.15E+08	19,600	589,000	4.418	0.723
30	10,128	10,128	10,128	2.15E+08	19,635	589,000	4.418	0.724
AVERAGE	10,128	10,128	10,128	2.15E+08	19,347	589,000	4.418	0.713

ASSUMPTIONS: Drift Rate = 0.00075%
TDS ppm = 0.70 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1990
INPUT DATA - UNIT 2

OCTOBER DAY	CW CONDUCTIVITY DATA umhos/cm	THERMAL GEN MWt/d	CW FLOW - No PUMPS/SHIFT Mids	Days	Swings	SUM - FANS OPER IN EA SHIFT Twr 01	Twr 02	Twr 03
1	27,450	90,972	4	4	4	48	48	48
2	27,650	79,344	4	4	4	48	48	48
3	22,100	89,267	4	4	4	48	48	48
4	22,450	90,872	4	4	4	48	48	48
5	22,400	90,899	4	4	4	48	48	48
6	25,900	90,890	4	4	4	48	46	48
7	25,550	90,853	4	4	4	48	45	48
8	29,750	90,872	4	4	4	46	45	48
9	29,500	90,835	4	4	4	45	45	48
10	26,900	90,890	4	4	4	45	45	48
11	27,000	90,863	4	4	4	45	45	48
12	27,150	90,853	4	4	4	45	45	48
13	27,500	90,808	4	4	4	45	45	48
14	27,250	90,917	4	4	4	45	45	48
15	26,850	90,872	4	4	4	45	45	48
16	27,350	90,890	4	4	4	45	45	48
17	28,400	88,601	4	4	4	45	45	48
18	27,250	73,617	4	4	4	45	45	48
19	27,500	74,018	4	4	4	45	45	48
20	26,750	86,357	4	4	4	45	45	48
21	28,700	71,227	4	4	4	22	45	48
22	25,350	90,698	4	4	4	44	45	48
23	25,350	90,817	4	4	4	45	45	48
24	25,400	90,872	4	4	4	45	45	48
25	25,300	90,872	4	4	4	45	45	48
26	26,050	90,881	4	4	4	45	46	48
27	25,650	90,881	4	4	4	45	48	48
28	25,900	90,936	4	4	4	45	48	48
29	26,650	90,908	4	4	4	45	48	48
30	26,350	90,917	4	4	4	45	48	48
31	26,650	90,917	4	4	4	45	48	48
AVERAGE	26,452	88,497	4	4	4	45	46	48

ASSUMPTIONS: Drift Rate = 0.00075%
TDS ppm = 0.74 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1990
CALCULATED TOWER PERFORMANCE PARAMETERS - UNIT 2

		Airflow /Tower. cu m/s			Heat	Calc	CW Flow	Calc Drift	
OCTOBER	DAY	Twr 01	Twr 02	Twr 03	BTU/min	TDS, ppm	gpm	gpm	lb/min
	1	10,128	10,128	10,128	2.16E+08	20,313	589,000	4.418	0.749
	2	10,128	10,128	10,128	1.88E+08	20,461	589,000	4.418	0.754
	3	10,128	10,128	10,128	2.12E+08	16,354	589,000	4.418	0.603
	4	10,128	10,128	10,128	2.15E+08	16,613	589,000	4.418	0.612
	5	10,128	10,128	10,128	2.15E+08	16,576	589,000	4.418	0.611
	6	10,128	9,706	10,128	2.15E+08	19,166	589,000	4.356	0.697
	7	10,128	9,495	10,128	2.15E+08	18,907	589,000	4.325	0.682
	8	9,706	9,495	10,128	2.15E+08	22,015	589,000	4.264	0.783
	9	9,495	9,495	10,128	2.15E+08	21,830	589,000	4.233	0.771
	10	9,495	9,495	10,128	2.15E+08	19,906	589,000	4.233	0.703
	11	9,495	9,495	10,128	2.15E+08	19,980	589,000	4.233	0.706
	12	9,495	9,495	10,128	2.15E+08	20,091	589,000	4.233	0.710
	13	9,495	9,495	10,128	2.15E+08	20,350	589,000	4.233	0.719
	14	9,495	9,495	10,128	2.15E+08	20,165	589,000	4.233	0.712
	15	9,495	9,495	10,128	2.15E+08	19,869	589,000	4.233	0.702
	16	9,495	9,495	10,128	2.15E+08	20,239	589,000	4.233	0.715
	17	9,495	9,495	10,128	2.10E+08	21,016	589,000	4.233	0.742
	18	9,495	9,495	10,128	1.74E+08	20,165	589,000	4.233	0.712
	19	9,495	9,495	10,128	1.75E+08	20,350	589,000	4.233	0.719
	20	9,495	9,495	10,128	2.05E+08	19,795	589,000	4.233	0.699
	21	4,642	9,495	10,128	1.69E+08	21,238	589,000	3.528	0.625
	22	9,284	9,495	10,128	2.15E+08	18,759	589,000	4.203	0.658
	23	9,495	9,495	10,128	2.15E+08	18,759	589,000	4.233	0.663
	24	9,495	9,495	10,128	2.15E+08	18,796	589,000	4.233	0.664
	25	9,495	9,495	10,128	2.15E+08	18,722	589,000	4.233	0.661
	26	9,495	9,706	10,128	2.15E+08	19,277	589,000	4.264	0.686
	27	9,495	10,128	10,128	2.15E+08	18,981	589,000	4.325	0.685
	28	9,495	10,128	10,128	2.16E+08	19,166	589,000	4.325	0.692
	29	9,495	10,128	10,128	2.15E+08	19,721	589,000	4.325	0.712
	30	9,495	10,128	10,128	2.15E+08	19,499	589,000	4.325	0.704
	31	9,495	10,128	10,128	2.15E+08	19,721	589,000	4.325	0.712
AVERAGE		9,481	9,713	10,128	2.10E+08	19,574	589,000	4.263	0.696

ASSUMPTIONS: Drift Rate = 0.00075%
TDS ppm = 0.74 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1990
INPUT DATA - UNIT 2

NOVEMBER DAY	CW CONDUCTIVITY DATA umhos/cm	THERMAL GEN MWt/d	CW FLOW - No PUMPS/SHIFT Mids	Days	Swings	SUM - FANS OPER IN EA SHIFT Twr 01	Twr 02	Twr 03
1	26,500	90,917	4	4	4	45	48	48
2	26,450	90,926	4	4	4	45	48	48
3	25,500	90,954	4	4	4	45	48	48
4	24,900	90,954	4	4	4	45	48	48
5	23,850	90,936	4	4	4	45	48	48
6	24,900	90,853	4	4	4	45	48	48
7	25,400	90,881	4	4	4	45	43	48
8	25,500	90,890	4	4	4	45	42	48
9	22,600	90,954	4	4	4	45	43	48
10	23,800	90,936	4	4	4	45	45	48
11	24,500	90,990	4	4	4	45	45	48
12	25,800	90,936	4	4	4	45	45	48
13	26,100	90,936	4	4	4	45	45	48
14	25,900	90,963	4	4	4	45	45	48
15	25,200	90,999	4	4	4	45	45	48
16	24,900	90,908	4	4	4	45	45	48
17	25,500	89,340	4	4	4	45	45	48
18	24,500	90,908	4	4	4	45	45	48
19	24,400	90,945	4	4	4	45	45	48
20	25,500	90,917	4	4	4	45	43	48
21	24,000	90,972	4	4	4	45	43	48
22	23,300	90,881	4	4	4	45	45	48
23	23,400	90,954	4	4	4	45	45	48
24	22,900	87,132	4	4	4	45	45	48
25	23,200	90,881	4	4	4	45	45	48
26	25,800	90,990	4	4	4	45	45	48
27	21,900	90,963	4	4	4	42	45	48
28	22,900	90,963	4	4	4	34	45	48
29	21,600	90,890	4	4	4	48	45	48
30	22,100	90,990	4	4	4	48	45	48
AVERAGE	24,427	90,755	4	4	4	45	45	48

ASSUMPTIONS: Drift Rate = 0.00075%
TDS ppm = 0.77 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1990
CALCULATED TOWER PERFORMANCE PARAMETERS - UNIT 2

NOVEMBER DAY	Airflow /Tower. cu m/s Twr 01	Twr 02	Twr 03	Heat BTU/min	Calc TDS, ppm	CW Flow gpm	Calc Drift gpm	lb/min
1	9,495	10,128	10,128	2.15E+08	20,405	589,000	4.325	0.737
2	9,495	10,128	10,128	2.15E+08	20,367	589,000	4.325	0.735
3	9,495	10,128	10,128	2.16E+08	19,635	589,000	4.325	0.709
4	9,495	10,128	10,128	2.16E+08	19,173	589,000	4.325	0.692
5	9,495	10,128	10,128	2.16E+08	18,365	589,000	4.325	0.663
6	9,495	10,128	10,128	2.15E+08	19,173	589,000	4.325	0.692
7	9,495	9,073	10,128	2.15E+08	19,558	589,000	4.172	0.681
8	9,495	8,862	10,128	2.15E+08	19,635	589,000	4.141	0.679
9	9,495	9,073	10,128	2.16E+08	17,402	589,000	4.172	0.606
10	9,495	9,495	10,128	2.16E+08	18,326	589,000	4.233	0.647
11	9,495	9,495	10,128	2.16E+08	18,865	589,000	4.233	0.666
12	9,495	9,495	10,128	2.16E+08	19,866	589,000	4.233	0.702
13	9,495	9,495	10,128	2.16E+08	20,097	589,000	4.233	0.710
14	9,495	9,495	10,128	2.16E+08	19,943	589,000	4.233	0.705
15	9,495	9,495	10,128	2.16E+08	19,404	589,000	4.233	0.686
16	9,495	9,495	10,128	2.15E+08	19,173	589,000	4.233	0.677
17	9,495	9,495	10,128	2.12E+08	19,635	589,000	4.233	0.694
18	9,495	9,495	10,128	2.15E+08	18,865	589,000	4.233	0.666
19	9,495	9,495	10,128	2.16E+08	18,788	589,000	4.233	0.664
20	9,495	9,073	10,128	2.15E+08	19,635	589,000	4.172	0.684
21	9,495	9,073	10,128	2.16E+08	18,480	589,000	4.172	0.643
22	9,495	9,495	10,128	2.15E+08	17,941	589,000	4.233	0.634
23	9,495	9,495	10,128	2.16E+08	18,018	589,000	4.233	0.637
24	9,495	9,495	10,128	2.07E+08	17,633	589,000	4.233	0.623
25	9,495	9,495	10,128	2.15E+08	17,864	589,000	4.233	0.631
26	9,495	9,495	10,128	2.16E+08	19,866	589,000	4.233	0.702
27	8,862	9,495	10,128	2.16E+08	16,863	589,000	4.141	0.583
28	7,174	9,495	10,128	2.16E+08	17,633	589,000	3.896	0.573
29	10,128	9,495	10,128	2.15E+08	16,632	589,000	4.325	0.600
30	10,128	9,495	10,128	2.16E+08	17,017	589,000	4.325	0.614
AVERAGE	9,439	9,544	10,128	2.15E+08	18,809	589,000	4.232	0.664

ASSUMPTIONS: Drift Rate = 0.00075%
TDS ppm = 0.77 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1990
INPUT DATA - UNIT 2

DECEMBER DAY	CW CONDUCTIVITY DATA umhos/cm	THERMAL GEN MWt/d	CW FLOW - No PUMPS/SHIFT Mids	Days	Swings	SUM - FANS OPER IN EA SHIFT Twr 01	Twr 02	Twr 03
1	21,800	90,954	4	4	4	48	45	48
2	21,300	91,027	4	4	4	48	39	48
3	23,300	90,999	4	4	4	48	43	48
4	22,700	91,036	4	4	4	48	42	48
5	22,000	90,981	4	4	4	48	42	41
6	22,600	90,999	4	4	4	48	42	48
7	23,800	90,981	4	4	4	48	38	48
8	23,400	91,008	4	4	4	48	47	48
9	23,500	91,027	4	4	4	48	41	48
10	22,500	90,945	4	4	4	48	45	46
11	22,700	90,926	4	4	4	48	46	45
12	24,700	90,990	4	4	4	48	46	45
13	25,400	90,926	4	4	4	48	45	45
14	21,900	91,036	4	4	4	48	45	46
15	20,500	91,008	4	4	4	48	45	48
16	22,000	90,954	4	4	4	48	45	48
17	20,000	90,972	4	4	4	48	45	44
18	20,800	90,908	4	4	4	48	45	36
19	20,800	90,945	4	4	4	48	45	43
20	22,000	90,999	4	4	4	48	26	48
21	20,600	80,110	4	4	4	28	28	39
22	22,700	90,936	4	4	4	33	40	48
23	22,400	91,027	4	4	4	25	38	40
24	22,900	91,027	4	4	4	33	42	38
25	20,100	91,045	4	4	4	40	36	42
26	22,800	91,045	4	4	4	40	44	42
27	23,600	91,008	4	4	4	41	36	41
28	24,600	90,954	4	4	4	46	41	45
29	24,900	90,954	4	4	4	48	44	45
30	24,200	90,981	4	4	4	42	41	41
31	24,000	91,054	4	4	4	42	39	41
AVERAGE	22,597	90,637	4	4	4	44	41	45

ASSUMPTIONS: Drift Rate = 0.00075%
TDS ppm = 0.77 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1990
CALCULATED TOWER PERFORMANCE PARAMETERS - UNIT 2

	Airflow /Tower. cu m/s			Heat	Calc	CW Flow	Calc Drift	
DECEMBER DAY	Twr 01	Twr 02	Twr 03	BTU/min	TDS, ppm	gpm	gpm	lb/min
1	10,128	9,495	10,128	2.16E+08	16,786	589,000	4.325	0.606
2	10,128	8,229	10,128	2.16E+08	16,401	589,000	4.141	0.567
3	10,128	9,073	10,128	2.16E+08	17,941	589,000	4.264	0.638
4	10,128	8,862	10,128	2.16E+08	17,479	589,000	4.233	0.617
5	10,128	8,862	8,651	2.16E+08	16,940	589,000	4.019	0.568
6	10,128	8,862	10,128	2.16E+08	17,402	589,000	4.233	0.615
7	10,128	8,018	10,128	2.16E+08	18,326	589,000	4.111	0.629
8	10,128	9,917	10,128	2.16E+08	18,018	589,000	4.387	0.660
9	10,128	8,651	10,128	2.16E+08	18,095	589,000	4.203	0.635
10	10,128	9,495	9,706	2.16E+08	17,325	589,000	4.264	0.616
11	10,128	9,706	9,495	2.15E+08	17,479	589,000	4.264	0.622
12	10,128	9,706	9,495	2.16E+08	19,019	589,000	4.264	0.677
13	10,128	9,495	9,495	2.15E+08	19,558	589,000	4.233	0.691
14	10,128	9,495	9,706	2.16E+08	16,863	589,000	4.264	0.600
15	10,128	9,495	10,128	2.16E+08	15,785	589,000	4.325	0.570
16	10,128	9,495	10,128	2.16E+08	16,940	589,000	4.325	0.611
17	10,128	9,495	9,284	2.16E+08	15,400	589,000	4.203	0.540
18	10,128	9,495	7,596	2.15E+08	16,016	589,000	3.957	0.529
19	10,128	9,495	9,073	2.16E+08	16,016	589,000	4.172	0.558
20	10,128	5,486	10,128	2.16E+08	16,940	589,000	3.743	0.529
21	5,908	5,908	8,229	1.90E+08	15,862	589,000	2.914	0.386
22	6,963	8,440	10,128	2.16E+08	17,479	589,000	3.712	0.541
23	5,275	8,018	8,440	2.16E+08	17,248	589,000	3.160	0.455
24	6,963	8,862	8,018	2.16E+08	17,633	589,000	3.467	0.510
25	8,440	7,596	8,862	2.16E+08	15,477	589,000	3.620	0.468
26	8,440	9,284	8,862	2.16E+08	17,556	589,000	3.865	0.566
27	8,651	7,596	8,651	2.16E+08	18,172	589,000	3.620	0.549
28	9,706	8,651	9,495	2.16E+08	18,942	589,000	4.049	0.640
29	10,128	9,284	9,495	2.16E+08	19,173	589,000	4.203	0.672
30	8,862	8,651	8,651	2.16E+08	18,634	589,000	3.804	0.592
31	8,862	8,229	8,651	2.16E+08	18,480	589,000	3.743	0.577
AVERAGE	9,379	8,753	9,400	2.15E+08	17,400	589,000	4.003	0.582

ASSUMPTIONS: Drift Rate = 0.00075%
TDS ppm = 0.77 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1990
INPUT DATA - UNIT 3

JANUARY	DAY	CW CONDUCTIVITY DATA umhos/cm	THERMAL GEN MWt/d	CW FLOW - No PUMPS/SHIFT Mids	Days	Swings	SUM - FANS OPER IN EA SHIFT Twr 01	Twr 02	Twr 03
	1	11,265	0	0	0	0	0	0	0
	2	9,065	0	0	0	0	0	0	0
	3	9,605	0	0	0	0	0	0	0
	4	9,475	0	0	0	0	0	0	0
	5	5,900	0	0	0	0	0	0	0
	6	5,930	0	0	0	0	0	0	0
	7	5,695	0	0	0	0	0	0	0
	8	9,755	0	0	0	0	0	0	0
	9	6,425	0	0	0	0	0	0	0
	10	6,460	0	0	0	0	0	0	0
	11	9,065	0	0	0	0	0	0	0
	12	6,895	0	0	0	0	0	0	0
	13	6,075	0	0	0	0	0	0	0
	14	5,995	0	0	0	0	0	0	0
	15	6,500	0	0	0	0	0	0	0
	16	6,530	0	0	0	0	0	0	0
	17	6,510	0	0	0	0	0	0	0
	18	6,595	1,368	0	0	0	0	0	0
	19	6,360	1,915	0	0	0	0	0	0
	20	8,765	8,117	0	0	0	0	0	0
	21	9,470	13,498	0	0	0	0	0	0
	22	7,420	16,681	0	0	0	0	0	0
	23	7,585	14,008	0	0	0	0	0	0
	24	7,975	21,797	4	4	4	0	0	0
	25	8,885	38,468	4	4	4	0	12	15
	26	10,005	45,418	4	4	4	0	0	21
	27	11,300	49,704	4	4	4	18	0	9
	28	12,250	60,201	4	4	4	21	9	36
	29	13,930	61,441	4	4	4	21	12	30
	30	13,600	63,557	4	4	4	27	12	33
	31	12,650	71,273	4	4	4	30	18	42
AVERAGE		8,514	15,079	1	1	1	4	2	6

ASSUMPTIONS: Drift Rate = 0.0002%
TDS ppm = 0.81 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1990
CALCULATED TOWER PERFORMANCE PARAMETERS - UNIT 3

		Airflow /Tower. cu m/s			Heat	Calc	CW Flow	Calc Drift	
JANUARY	DAY	Twr 01	Twr 02	Twr 03	BTU/min	TDS, ppm	gpm	gpm	lb/min
	1	0	0	0	0.00E+00	9,125	29,000	0.000	0.000
	2	0	0	0	0.00E+00	7,343	29,000	0.000	0.000
	3	0	0	0	0.00E+00	7,780	29,000	0.000	0.000
	4	0	0	0	0.00E+00	7,675	29,000	0.000	0.000
	5	0	0	0	0.00E+00	4,779	29,000	0.000	0.000
	6	0	0	0	0.00E+00	4,803	29,000	0.000	0.000
	7	0	0	0	0.00E+00	4,613	29,000	0.000	0.000
	8	0	0	0	0.00E+00	7,902	29,000	0.000	0.000
	9	0	0	0	0.00E+00	5,204	29,000	0.000	0.000
	10	0	0	0	0.00E+00	5,233	29,000	0.000	0.000
	11	0	0	0	0.00E+00	7,343	29,000	0.000	0.000
	12	0	0	0	0.00E+00	5,585	29,000	0.000	0.000
	13	0	0	0	0.00E+00	4,921	29,000	0.000	0.000
	14	0	0	0	0.00E+00	4,856	29,000	0.000	0.000
	15	0	0	0	0.00E+00	5,265	29,000	0.000	0.000
	16	0	0	0	0.00E+00	5,289	29,000	0.000	0.000
	17	0	0	0	0.00E+00	5,273	29,000	0.000	0.000
	18	0	0	0	3.24E+06	5,342	29,000	0.000	0.000
	19	0	0	0	4.54E+06	5,152	29,000	0.000	0.000
	20	0	0	0	1.92E+07	7,100	29,000	0.000	0.000
	21	0	0	0	3.20E+07	7,671	29,000	0.000	0.000
	22	0	0	0	3.95E+07	6,010	29,000	0.000	0.000
	23	0	0	0	3.32E+07	6,144	29,000	0.000	0.000
	24	0	0	0	5.17E+07	6,460	589,000	0.000	0.000
	25	0	2,532	3,165	9.12E+07	7,197	589,000	0.221	0.013
	26	0	0	4,431	1.08E+08	8,104	589,000	0.172	0.012
	27	3,798	0	1,899	1.18E+08	9,153	589,000	0.221	0.017
	28	4,431	1,899	7,596	1.43E+08	9,923	589,000	0.540	0.045
	29	4,431	2,532	6,330	1.46E+08	11,283	589,000	0.515	0.049
	30	5,697	2,532	6,963	1.51E+08	11,016	589,000	0.589	0.054
	31	6,330	3,798	8,862	1.69E+08	10,247	589,000	0.736	0.063
AVERAGE		796	429	1,266	3.57E+07	6,896	173,516	0.097	0.008

ASSUMPTIONS: Drift Rate = 0.0002%
TDS ppm = 0.81 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1990
INPUT DATA - UNIT 3

FEBRUARY DAY	CW CONDUCTIVITY DATA umhos/cm	THERMAL GEN MWt/d	CW FLOW - No PUMPS/SHIFT Mids	Days	Swings	SUM - FANS OPER IN EA SHIFT Twr 01	Twr 02	Twr 03
1	13,800	79,089	4	4	4	30	18	42
2	15,700	82,308	4	4	4	30	18	42
3	15,800	74,419	4	4	4	24	18	42
4	15,250	64,141	4	4	4	24	18	27
5	14,850	64,050	4	4	4	18	21	42
6	13,550	64,296	4	4	4	18	27	42
7	17,725	64,132	4	4	4	18	27	42
8	15,250	68,838	4	4	4	27	21	42
9	15,150	82,928	4	4	4	33	30	42
10	15,200	85,236	4	4	4	33	30	42
11	15,250	87,087	4	4	4	36	30	42
12	15,200	86,604	4	4	4	36	30	42
13	15,550	86,813	4	4	4	39	30	39
14	15,450	86,886	4	4	4	39	33	39
15	15,200	86,576	4	4	4	39	36	39
16	14,800	86,448	4	4	4	36	33	39
17	14,500	64,351	4	4	4	30	21	18
18	15,650	86,777	4	4	4	36	39	42
19	15,350	89,376	4	4	4	36	42	39
20	15,550	89,540	4	4	4	36	42	39
21	15,900	89,668	4	4	4	36	42	39
22	15,950	89,431	4	4	4	36	42	39
23	16,300	89,586	4	4	4	33	42	42
24	16,050	89,485	4	4	4	36	42	42
25	17,750	86,248	4	4	4	36	42	42
26	15,750	86,877	4	4	4	36	42	42
27	16,150	89,431	4	4	4	36	42	42
28	15,950	89,412	4	4	4	36	42	42
AVERAGE	15,521	81,787	4	4	4	32	32	40

ASSUMPTIONS: Drift Rate = 0.0002%
TDS ppm = 0.99 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1990
CALCULATED TOWER PERFORMANCE PARAMETERS - UNIT 3

	Airflow /Tower. cu m/s			Heat	Calc	CW Flow	Calc Drift	
FEBRUARY DAY	Twr 01	Twr 02	Twr 03	BTU/min	TDS, ppm	gpm	gpm	lb/min
1	6,330	3,798	8,862	1.87E+08	13,662	589,000	0.736	0.084
2	6,330	3,798	8,862	1.95E+08	15,543	589,000	0.736	0.095
3	5,064	3,798	8,862	1.76E+08	15,642	589,000	0.687	0.090
4	5,064	3,798	5,697	1.52E+08	15,098	589,000	0.564	0.071
5	3,798	4,431	8,862	1.52E+08	14,702	589,000	0.663	0.081
6	3,798	5,697	8,862	1.52E+08	13,415	589,000	0.712	0.080
7	3,798	5,697	8,862	1.52E+08	17,548	589,000	0.712	0.104
8	5,697	4,431	8,862	1.63E+08	15,098	589,000	0.736	0.093
9	6,963	6,330	8,862	1.97E+08	14,999	589,000	0.859	0.108
10	6,963	6,330	8,862	2.02E+08	15,048	589,000	0.859	0.108
11	7,596	6,330	8,862	2.06E+08	15,098	589,000	0.884	0.111
12	7,596	6,330	8,862	2.05E+08	15,048	589,000	0.884	0.111
13	8,229	6,330	8,229	2.06E+08	15,395	589,000	0.884	0.114
14	8,229	6,963	8,229	2.06E+08	15,296	589,000	0.908	0.116
15	8,229	7,596	8;229	2.05E+08	15,048	589,000	0.933	0.117
16	7,596	6,963	8,229	2.05E+08	14,652	589,000	0.884	0.108
17	6,330	4,431	3,798	1.53E+08	14,355	589,000	0.564	0.068
18	7,596	8,229	8,862	2.06E+08	15,494	589,000	0.957	0.124
19	7,596	8,862	8,229	2.12E+08	15,197	589,000	0.957	0.121
20	7,596	8,862	8,229	2.12E+08	15,395	589,000	0.957	0.123
21	7,596	8,862	8,229	2.13E+08	15,741	589,000	0.957	0.126
22	7,596	8,862	8,229	2.12E+08	15,791	589,000	0.957	0.126
23	6,963	8,862	8,862	2.12E+08	16,137	589,000	0.957	0.129
24	7,596	8,862	8,862	2.12E+08	15,890	589,000	0.982	0.130
25	7,596	8,862	8,862	2.04E+08	17,573	589,000	0.982	0.144
26	7,596	8,862	8,862	2.06E+08	15,593	589,000	0.982	0.128
27	7,596	8,862	8,862	2.12E+08	15,989	589,000	0.982	0.131
28	7,596	8,862	8,862	2.12E+08	15,791	589,000	0.982	0.129
AVERAGE	6,805	6,782	8,387	1.94E+08	15,365	589,000	0.852	0.110

ASSUMPTIONS: Drift Rate = 0.0002%
TDS ppm = 0.99 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1990
INPUT DATA - UNIT 3

MARCH	DAY	CW CONDUCTIVITY DATA umhos/cm	THERMAL GEN MWt/d	CW FLOW - No PUMPS/SHIFT Mids	Days	Swings	SUM - FANS OPER IN EA SHIFT Twr 01	Twr 02	Twr 03
	1	17,400	88,656	4	4	4	36	42	42
	2	17,650	88,245	4	4	4	39	42	42
	3	17,500	89,367	4	4	4	39	42	42
	4	17,250	89,239	4	4	4	39	42	42
	5	17,050	89,203	4	4	4	39	42	42
	6	17,000	89,166	4	4	4	33	42	42
	7	16,450	89,157	4	4	4	42	42	36
	8	16,500	89,294	4	4	4	42	42	36
	9	16,650	89,558	4	4	4	45	39	36
	10	16,700	90,790	4	4	4	45	39	42
	11	16,650	89,431	4	4	4	45	39	42
	12	16,200	89,878	4	4	4	45	39	36
	13	15,900	90,762	4	4	4	45	39	42
	14	15,080	90,717	4	4	4	45	39	42
	15	16,700	90,735	4	4	4	45	42	42
	16	16,900	88,610	4	4	4	42	42	42
	17	16,550	90,799	4	4	4	45	42	39
	18	16,850	90,799	4	4	4	45	42	42
	19	16,950	90,726	4	4	4	45	42	42
	20	17,400	90,744	4	4	4	42	39	42
	21	17,850	90,698	4	4	4	42	39	42
	22	17,500	90,771	4	4	4	48	42	45
	23	18,200	90,735	4	4	4	48	42	45
	24	18,550	90,771	4	4	4	45	45	45
	25	18,900	90,790	4	4	4	48	45	45
	26	17,400	90,771	4	4	4	45	45	45
	27	17,400	90,753	4	4	4	45	45	45
	28	18,500	90,771	4	4	4	45	45	45
	29	18,050	90,817	4	4	4	45	45	45
	30	17,850	90,799	4	4	4	45	45	45
	31	18,050	90,735	4	4	4	45	45	45
AVERAGE		17,212	90,138	4	4	4	43	42	42

ASSUMPTIONS: Drift Rate = 0.0002%
TDS ppm = 0.84 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1990
CALCULATED TOWER PERFORMANCE PARAMETERS - UNIT 3

MARCH	DAY	Airflow /Tower. cu m/s Twr 01	Twr 02	Twr 03	Heat BTU/min	Calc TDS, ppm	CW Flow gpm	Calc Drift gpm	lb/min
	1	7,596	8,862	8,862	2.10E+08	14,616	589,000	0.982	0.120
	2	8,229	8,862	8,862	2.09E+08	14,826	589,000	1.006	0.124
	3	8,229	8,862	8,862	2.12E+08	14,700	589,000	1.006	0.123
	4	8,229	8,862	8,862	2.11E+08	14,490	589,000	1.006	0.122
	5	8,229	8,862	8,862	2.11E+08	14,322	589,000	1.006	0.120
	6	6,963	8,862	8,862	2.11E+08	14,280	589,000	0.957	0.114
	7	8,862	8,862	7,596	2.11E+08	13,818	589,000	0.982	0.113
	8	8,862	8,862	7,596	2.12E+08	13,860	589,000	0.982	0.114
	9	9,495	8,229	7,596	2.12E+08	13,986	589,000	0.982	0.115
	10	9,495	8,229	8,862	2.15E+08	14,028	589,000	1.031	0.121
	11	9,495	8,229	8,862	2.12E+08	13,986	589,000	1.031	0.120
	12	9,495	8,229	7,596	2.13E+08	13,608	589,000	0.982	0.111
	13	9,495	8,229	8,862	2.15E+08	13,356	589,000	1.031	0.115
	14	9,495	8,229	8,862	2.15E+08	12,667	589,000	1.031	0.109
	15	9,495	8,862	8,862	2.15E+08	14,028	589,000	1.055	0.124
	16	8,862	8,862	8,862	2.10E+08	14,196	589,000	1.031	0.122
	17	9,495	8,862	8,229	2.15E+08	13,902	589,000	1.031	0.120
	18	9,495	8,862	8,862	2.15E+08	14,154	589,000	1.055	0.125
	19	9,495	8,862	8,862	2.15E+08	14,238	589,000	1.055	0.125
	20	8,862	8,229	8,862	2.15E+08	14,616	589,000	1.006	0.123
	21	8,862	8,229	8,862	2.15E+08	14,994	589,000	1.006	0.126
	22	10,128	8,862	9,495	2.15E+08	14,700	589,000	1.104	0.135
	23	10,128	8,862	9,495	2.15E+08	15,288	589,000	1.104	0.141
	24	9,495	9,495	9,495	2.15E+08	15,582	589,000	1.104	0.144
	25	10,128	9,495	9,495	2.15E+08	15,876	589,000	1.129	0.150
	26	9,495	9,495	9,495	2.15E+08	14,616	589,000	1.104	0.135
	27	9,495	9,495	9,495	2.15E+08	14,616	589,000	1.104	0.135
	28	9,495	9,495	9,495	2.15E+08	15,540	589,000	1.104	0.143
	29	9,495	9,495	9,495	2.15E+08	15,162	589,000	1.104	0.140
	30	9,495	9,495	9,495	2.15E+08	14,994	589,000	1.104	0.138
	31	9,495	9,495	9,495	2.15E+08	15,162	589,000	1.104	0.140
AVERAGE		9,148	8,862	8,882	2.14E+08	14,458	589,000	1.043	0.126

ASSUMPTIONS: Drift Rate = 0.0002%
TDS ppm = 0.84 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1990
INPUT DATA - UNIT 3

APRIL	DAY	CW CONDUCTIVITY DATA umhos/cm	THERMAL GEN MWt/d	CW FLOW - No PUMPS/SHIFT Mids	Days	Swings	SUM - FANS OPER IN EA SHIFT Twr 01	Twr 02	Twr 03
	1	17,750	90,653	4	4	4	45	45	48
	2	17,700	90,808	4	4	4	48	45	48
	3	17,300	90,853	4	4	4	48	45	48
	4	18,100	90,762	4	4	4	48	45	48
	5	18,050	90,698	4	4	4	48	45	48
	6	18,200	90,781	4	4	4	48	45	48
	7	18,550	90,790	4	4	4	48	45	48
	8	18,750	90,799	4	4	4	48	45	48
	9	18,250	90,835	4	4	4	48	45	48
	10	18,250	90,781	4	4	4	48	45	48
	11	19,050	90,771	4	4	4	48	48	48
	12	19,000	90,771	4	4	4	48	48	48
	13	17,200	90,662	4	4	4	48	48	48
	14	17,650	12,950	4	4	4	0	0	0
	15	17,150	0	2	2	2	0	0	0
	16	17,400	0	2	2	2	0	0	0
	17	17,100	0	2	2	2	0	0	0
	18	17,700	0	2	2	2	0	0	0
	19	17,250	4,040	2	2	2	0	0	0
	20	18,450	22,964	4	4	4	24	0	0
	21	16,950	54,912	4	4	4	48	12	9
	22	17,150	82,253	4	4	4	48	45	45
	23	17,150	82,290	4	4	4	48	45	48
	24	18,700	82,481	4	4	4	48	45	48
	25	17,400	82,563	4	4	4	48	45	48
	26	18,450	82,655	4	4	4	48	45	48
	27	17,600	82,527	4	4	4	48	48	48
	28	18,750	50,616	4	4	4	0	18	48
	29	17,250	87,479	4	4	4	45	45	48
	30	20,500	90,635	4	4	4	45	42	48
AVERAGE		17,958	66,611	4	4	4	36	33	35

ASSUMPTIONS: Drift Rate = 0.0002%
TDS ppm = 0.81 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1990
CALCULATED TOWER PERFORMANCE PARAMETERS - UNIT 3

APRIL	DAY	Airflow /Tower. cu m/s Twr 01	Twr 02	Twr 03	Heat BTU/min	Calc TDS, ppm	CW Flow gpm	Calc Drift gpm	lb/min
	1	9,495	9,495	10,128	2.15E+08	14,378	589,000	1.129	0.135
	2	10,128	9,495	10,128	2.15E+08	14,337	589,000	1.153	0.138
	3	10,128	9,495	10,128	2.15E+08	14,013	589,000	1.153	0.135
	4	10,128	9,495	10,128	2.15E+08	14,661	589,000	1.153	0.141
	5	10,128	9,495	10,128	2.15E+08	14,621	589,000	1.153	0.141
	6	10,128	9,495	10,128	2.15E+08	14,742	589,000	1.153	0.142
	7	10,128	9,495	10,128	2.15E+08	15,026	589,000	1.153	0.145
	8	10,128	9,495	10,128	2.15E+08	15,188	589,000	1.153	0.146
	9	10,128	9,495	10,128	2.15E+08	14,783	589,000	1.153	0.142
	10	10,128	9,495	10,128	2.15E+08	14,783	589,000	1.153	0.142
	11	10,128	10,128	10,128	2.15E+08	15,431	589,000	1.178	0.152
	12	10,128	10,128	10,128	2.15E+08	15,390	589,000	1.178	0.151
	13	10,128	10,128	10,128	2.15E+08	13,932	589,000	1.178	0.137
	14	0	0	0	3.07E+07	14,297	589,000	0.000	0.000
	15	0	0	0	0.00E+00	13,892	309,000	0.000	0.000
	16	0	0	0	0.00E+00	14,094	309,000	0.000	0.000
	17	0	0	0	0.00E+00	13,851	309,000	0.000	0.000
	18	0	0	0	0.00E+00	14,337	309,000	0.000	0.000
	19	0	0	0	9.57E+06	13,973	309,000	0.000	0.000
	20	5,064	0	0	5.44E+07	14,945	589,000	0.196	0.024
	21	10,128	2,532	1,899	1.30E+08	13,730	589,000	0.564	0.065
	22	10,128	9,495	9,495	1.95E+08	13,892	589,000	1.129	0.131
	23	10,128	9,495	10,128	1.95E+08	13,892	589,000	1.153	0.134
	24	10,128	9,495	10,128	1.95E+08	15,147	589,000	1.153	0.146
	25	10,128	9,495	10,128	1.96E+08	14,094	589,000	1.153	0.136
	26	10,128	9,495	10,128	1.96E+08	14,945	589,000	1.153	0.144
	27	10,128	10,128	10,128	1.96E+08	14,256	589,000	1.178	0.140
	28	0	3,798	10,128	1.20E+08	15,188	589,000	0.540	0.068
	29	9,495	9,495	10,128	2.07E+08	13,973	589,000	1.129	0.132
	30	9,495	8,862	10,128	2.15E+08	16,605	589,000	1.104	0.153
AVERAGE		7,533	6,921	7,469	1.58E+08	14,546	542,333	0.850	0.104

ASSUMPTIONS: Drift Rate = 0.0002%
TDS ppm = 0.81 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1990
CALCULATED TOWER PERFORMANCE PARAMETERS - UNIT 3

MAY	DAY	Airflow /Tower. cu m/s Twr 01	Twr 02	Twr 03	Heat BTU/min	Calc TDS, ppm	CW Flow gpm	Calc Drift gpm	lb/min
	1	9,495	8,862	10,128	2.15E+08	14,089	589,000	1.104	0.130
	2	9,495	8,862	10,128	2.15E+08	15,440	589,000	1.104	0.142
	3	9,495	8,862	10,128	2.15E+08	16,024	589,000	1.104	0.148
	4	10,128	9,495	10,128	2.15E+08	17,155	589,000	1.153	0.165
	5	10,128	9,495	10,128	2.15E+08	17,630	589,000	1.153	0.170
	6	10,128	9,495	10,128	2.15E+08	17,995	589,000	1.153	0.173
	7	9,495	9,495	10,128	2.15E+08	17,666	589,000	1.129	0.166
	8	9,495	9,495	10,128	2.15E+08	18,141	589,000	1.129	0.171
	9	10,128	9,495	10,128	2.15E+08	18,031	589,000	1.153	0.174
	10	10,128	9,495	10,128	2.15E+08	18,506	589,000	1.153	0.178
	11	10,128	9,495	10,128	2.15E+08	17,849	589,000	1.153	0.172
	12	10,128	9,495	10,128	2.11E+08	17,666	589,000	1.153	0.170
	13	10,128	9,495	10,128	2.15E+08	17,155	589,000	1.153	0.165
	14	10,128	9,495	10,128	2.15E+08	16,608	589,000	1.153	0.160
	15	10,128	9,495	10,128	2.15E+08	16,900	589,000	1.153	0.163
	16	10,128	9,495	10,128	2.15E+08	16,535	589,000	1.153	0.159
	17	10,128	9,495	10,128	2.15E+08	16,681	589,000	1.153	0.161
	18	10,128	9,495	10,128	2.15E+08	16,389	589,000	1.153	0.158
	19	10,128	9,495	10,128	2.15E+08	16,206	589,000	1.153	0.156
	20	10,128	9,495	10,128	2.15E+08	15,659	589,000	1.153	0.151
	21	10,128	9,495	10,128	2.15E+08	15,841	589,000	1.153	0.152
	22	10,128	9,495	10,128	2.15E+08	15,914	589,000	1.153	0.153
	23	10,128	9,495	10,128	2.15E+08	16,097	589,000	1.153	0.155
	24	10,128	9,495	10,128	2.15E+08	15,987	589,000	1.153	0.154
	25	10,128	9,495	10,128	2.15E+08	15,549	589,000	1.153	0.150
	26	10,128	9,495	10,128	2.15E+08	15,476	589,000	1.153	0.149
	27	10,128	9,495	10,128	2.15E+08	15,403	589,000	1.153	0.148
	28	10,128	9,495	10,128	2.15E+08	15,038	589,000	1.153	0.145
	29	10,128	9,495	10,128	1.91E+08	15,549	589,000	1.153	0.150
	30	7,596	7,596	7,596	1.79E+08	15,330	589,000	0.884	0.113
	31	10,128	9,495	10,128	2.15E+08	15,330	589,000	1.153	0.148
AVERAGE		9,944	9,372	10,046	2.13E+08	16,446	589,000	1.138	0.156

ASSUMPTIONS: Drift Rate = 0.0002%
TDS ppm = 0.73 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1990
INPUT DATA - UNIT 3

MAY	DAY	CW CONDUCTIVITY DATA umhos/cm	THERMAL GEN MWt/d	CW FLOW - No PUMPS/SHIFT Mids	Days	Swings	SUM - FANS OPER IN EA SHIFT Twr 01	Twr 02	Twr 03
	1	19,300	90,735	4	4	4	45	42	48
	2	21,150	90,844	4	4	4	45	42	48
	3	21,950	90,799	4	4	4	45	42	48
	4	23,500	90,726	4	4	4	48	45	48
	5	24,150	90,808	4	4	4	48	45	48
	6	24,650	90,771	4	4	4	48	45	48
	7	24,200	90,689	4	4	4	45	45	48
	8	24,850	90,744	4	4	4	45	45	48
	9	24,700	90,780	4	4	4	48	45	48
	10	25,350	90,771	4	4	4	48	45	48
	11	24,450	90,771	4	4	4	48	45	48
	12	24,200	89,084	4	4	4	48	45	48
	13	23,500	90,790	4	4	4	48	45	48
	14	22,750	90,835	4	4	4	48	45	48
	15	23,150	90,872	4	4	4	48	45	48
	16	22,650	90,899	4	4	4	48	45	48
	17	22,850	90,835	4	4	4	48	45	48
	18	22,450	90,835	4	4	4	48	45	48
	19	22,200	90,771	4	4	4	48	45	48
	20	21,450	90,863	4	4	4	48	45	48
	21	21,700	90,844	4	4	4	48	45	48
	22	21,800	90,872	4	4	4	48	45	48
	23	22,050	90,835	4	4	4	48	45	48
	24	21,900	90,872	4	4	4	48	45	48
	25	21,300	90,863	4	4	4	48	45	48
	26	21,200	90,835	4	4	4	48	45	48
	27	21,100	90,872	4	4	4	48	45	48
	28	20,600	90,853	4	4	4	48	45	48
	29	21,300	80,785	4	4	4	48	45	48
	30	21,000	75,432	4	4	4	36	36	36
	31	21,000	90,835	4	4	4	48	45	48
AVERAGE		22,529	89,939	4	4	4	47	44	48

ASSUMPTIONS: Drift Rate = 0.0002%
TDS ppm = 0.73 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1990
INPUT DATA - UNIT 3

JUNE	DAY	CW CONDUCTIVITY DATA umhos/cm	THERMAL GEN MWt/d	CW FLOW - No PUMPS/SHIFT Mids	Days	Swings	SUM - FANS OPER IN EA SHIFT Twr 01	Twr 02	Twr 03
	1	21,500	90,881	4	4	4	48	45	48
	2	21,400	90,872	4	4	4	48	45	48
	3	21,650	90,872	4	4	4	48	45	48
	4	21,800	90,817	4	4	4	48	45	48
	5	23,000	90,844	4	4	4	48	45	48
	6	23,100	90,853	4	4	4	48	45	48
	7	23,000	90,808	4	4	4	48	45	48
	8	23,250	90,799	4	4	4	48	45	48
	9	24,300	89,330	4	4	4	48	45	48
	10	23,750	90,835	4	4	4	48	48	48
	11	23,250	90,780	4	4	4	48	48	48
	12	23,200	90,844	4	4	4	48	48	48
	13	22,750	90,863	4	4	4	48	48	48
	14	22,500	90,826	4	4	4	48	48	48
	15	22,900	90,835	4	4	4	48	48	48
	16	22,250	90,780	4	4	4	48	48	48
	17	22,500	90,817	4	4	4	48	48	48
	18	22,100	90,872	4	4	4	48	48	48
	19	25,200	90,881	4	4	4	48	48	48
	20	23,150	90,835	4	4	4	48	48	48
	21	24,800	90,735	4	4	4	48	48	48
	22	24,450	90,835	4	4	4	48	48	48
	23	24,950	90,780	4	4	4	48	48	48
	24	25,400	90,835	4	4	4	48	48	48
	25	25,350	90,817	4	4	4	48	48	48
	26	25,300	90,826	4	4	4	48	48	48
	27	25,550	90,790	4	4	4	48	48	48
	28	27,000	90,826	4	4	4	48	48	48
	29	27,450	90,771	4	4	4	48	48	48
	30	26,700	90,881	4	4	4	48	48	48
AVERAGE		23,783	90,778	4	4	4	48	47	48

ASSUMPTIONS: Drift Rate = 0.0002%
TDS ppm = 0.74 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1990
CALCULATED TOWER PERFORMANCE PARAMETERS - UNIT 3

JUNE	DAY	Airflow /Tower. cu m/s Twr 01	Twr 02	Twr 03	Heat BTU/min	Calc TDS, ppm	CW Flow gpm	Calc Drift gpm	lb/min
	1	10,128	9,495	10,128	2.15E+08	15,910	589,000	1.153	0.153
	2	10,128	9,495	10,128	2.15E+08	15,836	589,000	1.153	0.152
	3	10,128	9,495	10,128	2.15E+08	16,021	589,000	1.153	0.154
	4	10,128	9,495	10,128	2.15E+08	16,132	589,000	1.153	0.155
	5	10,128	9,495	10,128	2.15E+08	17,020	589,000	1.153	0.164
	6	10,128	9,495	10,128	2.15E+08	17,094	589,000	1.153	0.165
	7	10,128	9,495	10,128	2.15E+08	17,020	589,000	1.153	0.164
	8	10,128	9,495	10,128	2.15E+08	17,205	589,000	1.153	0.166
	9	10,128	9,495	10,128	2.12E+08	17,982	589,000	1.153	0.173
	10	10,128	10,128	10,128	2.15E+08	17,575	589,000	1.178	0.173
	11	10,128	10,128	10,128	2.15E+08	17,205	589,000	1.178	0.169
	12	10,128	10,128	10,128	2.15E+08	17,168	589,000	1.178	0.169
	13	10,128	10,128	10,128	2.15E+08	16,835	589,000	1.178	0.165
	14	10,128	10,128	10,128	2.15E+08	16,650	589,000	1.178	0.164
	15	10,128	10,128	10,128	2.15E+08	16,946	589,000	1.178	0.167
	16	10,128	10,128	10,128	2.15E+08	16,465	589,000	1.178	0.162
	17	10,128	10,128	10,128	2.15E+08	16,650	589,000	1.178	0.164
	18	10,128	10,128	10,128	2.15E+08	16,354	589,000	1.178	0.161
	19	10,128	10,128	10,128	2.15E+08	18,648	589,000	1.178	0.183
	20	10,128	10,128	10,128	2.15E+08	17,131	589,000	1.178	0.168
	21	10,128	10,128	10,128	2.15E+08	18,352	589,000	1.178	0.180
	22	10,128	10,128	10,128	2.15E+08	18,093	589,000	1.178	0.178
	23	10,128	10,128	10,128	2.15E+08	18,463	589,000	1.178	0.181
	24	10,128	10,128	10,128	2.15E+08	18,796	589,000	1.178	0.185
	25	10,128	10,128	10,128	2.15E+08	18,759	589,000	1.178	0.184
	26	10,128	10,128	10,128	2.15E+08	18,722	589,000	1.178	0.184
	27	10,128	10,128	10,128	2.15E+08	18,907	589,000	1.178	0.186
	28	10,128	10,128	10,128	2.15E+08	19,980	589,000	1.178	0.196
	29	10,128	10,128	10,128	2.15E+08	20,313	589,000	1.178	0.200
	30	10,128	10,128	10,128	2.15E+08	19,758	589,000	1.178	0.194
AVERAGE		10,128	9,938	10,128	2.15E+08	17,600	589,000	1.171	0.172

ASSUMPTIONS: Drift Rate = 0.0002%
TDS ppm = 0.74 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1990
INPUT DATA - UNIT 3

JULY	DAY	CW CONDUCTIVITY DATA umhos/cm	THERMAL GEN MWt/d	CW FLOW - No PUMPS/SHIFT Mids	Days	Swings	SUM - FANS OPER IN EA SHIFT Twr 01	Twr 02	Twr 03
	1	27,300	90,844	4	4	4	48	48	48
	2	27,350	90,790	4	4	4	48	48	48
	3	26,200	90,817	4	4	4	48	48	48
	4	26,150	90,808	4	4	4	48	48	48
	5	25,400	90,799	4	4	4	48	48	48
	6	26,400	90,853	4	4	4	48	48	48
	7	25,700	89,349	4	4	4	48	48	48
	8	25,600	90,790	4	4	4	48	48	48
	9	25,900	90,863	4	4	4	48	48	48
	10	25,700	90,826	4	4	4	48	48	48
	11	25,850	90,762	4	4	4	48	48	48
	12	25,650	90,808	4	4	4	48	48	48
	13	24,950	90,853	4	4	4	48	48	48
	14	24,800	90,890	4	4	4	48	48	48
	15	24,450	90,890	4	4	4	48	48	48
	16	24,500	90,808	4	4	4	48	48	48
	17	24,550	90,835	4	4	4	48	48	48
	18	24,150	90,853	4	4	4	48	48	48
	19	24,250	90,853	4	4	4	48	48	48
	20	25,650	90,853	4	4	4	48	48	48
	21	26,450	90,826	4	4	4	48	48	48
	22	24,800	90,881	4	4	4	48	48	48
	23	24,800	90,844	4	4	4	48	48	48
	24	25,150	90,872	4	4	4	48	48	48
	25	24,550	90,872	4	4	4	48	48	48
	26	24,375	90,826	4	4	4	48	48	48
	27	24,300	90,872	4	4	4	48	48	48
	28	24,400	90,853	4	4	4	48	48	48
	29	23,850	90,835	4	4	4	48	48	48
	30	24,950	90,844	4	4	4	48	48	48
	31	25,200	90,808	4	4	4	48	48	48
AVERAGE		25,269	90,790	4	4	4	48	48	48

ASSUMPTIONS: Drift Rate = 0.0002%
TDS ppm = 0.69 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1990
CALCULATED TOWER PERFORMANCE PARAMETERS - UNIT 3

		Airflow /Tower. cu m/s			Heat	Calc	CW Flow	Calc Drift	
JULY	DAY	Twr 01	Twr 02	Twr 03	BTU/min	TDS, ppm	gpm	gpm	lb/min
	1	10,128	10,128	10,128	2.15E+08	18,837	589,000	1.178	0.185
	2	10,128	10,128	10,128	2.15E+08	18,872	589,000	1.178	0.186
	3	10,128	10,128	10,128	2.15E+08	18,078	589,000	1.178	0.178
	4	10,128	10,128	10,128	2.15E+08	18,044	589,000	1.178	0.177
	5	10,128	10,128	10,128	2.15E+08	17,526	589,000	1.178	0.172
	6	10,128	10,128	10,128	2.15E+08	18,216	589,000	1.178	0.179
	7	10,128	10,128	10,128	2.12E+08	17,733	589,000	1.178	0.174
	8	10,128	10,128	10,128	2.15E+08	17,664	589,000	1.178	0.174
	9	10,128	10,128	10,128	2.15E+08	17,871	589,000	1.178	0.176
	10	10,128	10,128	10,128	2.15E+08	17,733	589,000	1.178	0.174
	11	10,128	10,128	10,128	2.15E+08	17,837	589,000	1.178	0.175
	12	10,128	10,128	10,128	2.15E+08	17,699	589,000	1.178	0.174
	13	10,128	10,128	10,128	2.15E+08	17,216	589,000	1.178	0.169
	14	10,128	10,128	10,128	2.15E+08	17,112	589,000	1.178	0.168
	15	10,128	10,128	10,128	2.15E+08	16,871	589,000	1.178	0.166
	16	10,128	10,128	10,128	2.15E+08	16,905	589,000	1.178	0.166
	17	10,128	10,128	10,128	2.15E+08	16,940	589,000	1.178	0.167
	18	10,128	10,128	10,128	2.15E+08	16,664	589,000	1.178	0.164
	19	10,128	10,128	10,128	2.15E+08	16,733	589,000	1.178	0.164
	20	10,128	10,128	10,128	2.15E+08	17,699	589,000	1.178	0.174
	21	10,128	10,128	10,128	2.15E+08	18,251	589,000	1.178	0.179
	22	10,128	10,128	10,128	2.15E+08	17,112	589,000	1.178	0.168
	23	10,128	10,128	10,128	2.15E+08	17,112	589,000	1.178	0.168
	24	10,128	10,128	10,128	2.15E+08	17,354	589,000	1.178	0.171
	25	10,128	10,128	10,128	2.15E+08	16,940	589,000	1.178	0.167
	26	10,128	10,128	10,128	2.15E+08	16,819	589,000	1.178	0.165
	27	10,128	10,128	10,128	2.15E+08	16,767	589,000	1.178	0.165
	28	10,128	10,128	10,128	2.15E+08	16,836	589,000	1.178	0.166
	29	10,128	10,128	10,128	2.15E+08	16,457	589,000	1.178	0.162
	30	10,128	10,128	10,128	2.15E+08	17,216	589,000	1.178	0.169
	31	10,128	10,128	10,128	2.15E+08	17,388	589,000	1.178	0.171
AVERAGE		10,128	10,128	10,128	2.15E+08	17,435	589,000	1.178	0.171

ASSUMPTIONS: Drift Rate = 0.0002%
TDS ppm = 0.69 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1990
INPUT DATA - UNIT 3

AUGUST	DAY	CW CONDUCTIVITY DATA umhos/cm	THERMAL GEN MWt/d	CW FLOW - No PUMPS/SHIFT Mids	Days	Swings	SUM - FANS OPER IN EA SHIFT Twr 01	Twr 02	Twr 03
	1	25,600	90,881	4	4	4	48	48	48
	2	26,850	90,853	4	4	4	48	48	48
	3	26,100	90,817	4	4	4	48	48	48
	4	26,400	88,728	4	4	4	48	48	48
	5	27,000	64,095	4	4	4	40	40	40
	6	25,500	0	4	4	4	0	0	0
	7	23,400	10,616	4	4	4	6	6	0
	8	22,600	52,057	4	4	4	37	44	17
	9	22,750	89,622	4	4	4	47	48	47
	10	23,450	90,826	4	4	4	48	48	48
	11	25,000	90,835	4	4	4	48	48	48
	12	25,300	90,826	4	4	4	48	48	48
	13	26,300	90,771	4	4	4	48	48	48
	14	26,100	90,835	4	4	4	48	48	48
	15	26,200	90,799	4	4	4	48	48	48
	16	27,850	90,817	4	4	4	48	48	48
	17	28,050	90,844	4	4	4	48	48	48
	18	28,400	90,908	4	4	4	48	48	48
	19	28,350	90,890	4	4	4	48	48	48
	20	29,750	90,853	4	4	4	48	48	48
	21	29,500	90,835	4	4	4	48	48	48
	22	30,300	90,890	4	4	4	48	48	48
	23	30,400	90,890	4	4	4	48	48	48
	24	27,600	90,844	4	4	4	48	46	48
	25	27,950	90,863	4	4	4	48	45	48
	26	27,550	90,835	4	4	4	48	45	48
	27	26,000	90,835	4	4	4	48	46	48
	28	26,200	90,844	4	4	4	48	48	48
	29	25,350	90,853	4	4	4	48	48	48
	30	24,850	90,817	4	4	4	48	48	48
	31	25,100	90,817	4	4	4	48	48	48
AVERAGE		26,508	83,103	4	4	4	44	44	44

ASSUMPTIONS: Drift Rate = 0.0002%
TDS ppm = 1.15 x Conductivity, umhos/cm.
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1990
CALCULATED TOWER PERFORMANCE PARAMETERS - UNIT 3

AUGUST	DAY	Airflow /Tower. cu m/s Twr 01	Twr 02	Twr 03	Heat BTU/min	Calc TDS, ppm	CW Flow gpm	Calc Drift gpm	lb/min
	1	10,128	10,128	10,128	2.15E+08	29,440	589,000	1.178	0.289
	2	10,128	10,128	10,128	2.15E+08	30,877	589,000	1.178	0.304
	3	10,128	10,128	10,128	2.15E+08	30,015	589,000	1.178	0.295
	4	10,128	10,128	10,128	2.10E+08	30,360	589,000	1.178	0.298
	5	8,440	8,440	8,440	1.52E+08	31,050	589,000	0.982	0.254
	6	0	0	0	0.00E+00	29,325	589,000	0.000	0.000
	7	1,266	1,266	0	2.52E+07	26,910	589,000	0.098	0.022
	8	7,807	9,284	3,587	1.23E+08	25,990	589,000	0.802	0.174
	9	9,917	10,128	9,917	2.12E+08	26,162	589,000	1.162	0.254
	10	10,128	10,128	10,128	2.15E+08	26,967	589,000	1.178	0.265
	11	10,128	10,128	10,128	2.15E+08	28,750	589,000	1.178	0.283
	12	10,128	10,128	10,128	2.15E+08	29,095	589,000	1.178	0.286
	13	10,128	10,128	10,128	2.15E+08	30,245	589,000	1.178	0.297
	14	10,128	10,128	10,128	2.15E+08	30,015	589,000	1.178	0.295
	15	10,128	10,128	10,128	2.15E+08	30,130	589,000	1.178	0.296
	16	10,128	10,128	10,128	2.15E+08	32,027	589,000	1.178	0.315
	17	10,128	10,128	10,128	2.15E+08	32,257	589,000	1.178	0.317
	18	10,128	10,128	10,128	2.15E+08	32,660	589,000	1.178	0.321
	19	10,128	10,128	10,128	2.15E+08	32,602	589,000	1.178	0.320
	20	10,128	10,128	10,128	2.15E+08	34,213	589,000	1.178	0.336
	21	10,128	10,128	10,128	2.15E+08	33,925	589,000	1.178	0.333
	22	10,128	10,128	10,128	2.15E+08	34,845	589,000	1.178	0.343
	23	10,128	10,128	10,128	2.15E+08	34,960	589,000	1.178	0.344
	24	10,128	9,706	10,128	2.15E+08	31,740	589,000	1.162	0.308
	25	10,128	9,495	10,128	2.15E+08	32,142	589,000	1.153	0.309
	26	10,128	9,495	10,128	2.15E+08	31,682	589,000	1.153	0.305
	27	10,128	9,706	10,128	2.15E+08	29,900	589,000	1.162	0.290
	28	10,128	10,128	10,128	2.15E+08	30,130	589,000	1.178	0.296
	29	10,128	10,128	10,128	2.15E+08	29,152	589,000	1.178	0.287
	30	10,128	10,128	10,128	2.15E+08	28,577	589,000	1.178	0.281
	31	10,128	10,128	10,128	2.15E+08	28,865	589,000	1.178	0.284
AVERAGE		9,379	9,366	9,202	1.97E+08	30,484	589,000	1.084	0.277

ASSUMPTIONS: Drift Rate = 0.0002%
TDS ppm = 1.15 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1990
INPUT DATA - UNIT 3

SEPTEMBER DAY	CW CONDUCTIVITY DATA umhos/cm	THERMAL GEN MWt/d	CW FLOW - No PUMPS/SHIFT Mids	Days	Swings	SUM - FANS OPER IN EA SHIFT Twr 01	Twr 02	Twr 03
1	24,900	90,835	4	4	4	48	48	48
2	25,700	90,826	4	4	4	48	48	48
3	25,450	90,835	4	4	4	48	48	48
4	25,300	90,926	4	4	4	48	48	48
5	25,900	90,863	4	4	4	48	48	48
6	29,650	90,771	4	4	4	48	48	48
7	29,100	90,826	4	4	4	48	48	48
8	29,350	66,950	4	4	4	30	48	48
9	28,250	64,260	4	4	4	48	48	48
10	28,850	89,732	4	4	4	48	48	48
11	28,950	90,799	4	4	4	48	48	48
12	31,350	90,826	4	4	4	48	48	48
13	31,750	90,835	4	4	4	48	48	48
14	33,450	90,863	4	4	4	48	48	48
15	33,400	90,863	4	4	4	48	48	48
16	30,900	90,844	4	4	4	48	48	48
17	29,800	90,835	4	4	4	48	48	48
18	30,950	90,771	4	4	4	48	48	48
19	30,600	89,285	4	4	4	48	48	48
20	30,700	89,868	4	4	4	48	48	48
21	31,600	90,844	4	4	4	48	48	48
22	29,650	90,863	4	4	4	48	48	48
23	29,700	90,872	4	4	4	48	48	48
24	29,800	90,799	4	4	4	48	48	48
25	29,650	90,844	4	4	4	48	48	48
26	29,300	90,826	4	4	4	48	48	48
27	28,950	90,826	4	4	4	48	48	48
28	29,200	90,808	4	4	4	48	48	48
29	28,950	89,385	4	4	4	48	48	48
30	29,700	90,881	4	4	4	48	48	45
AVERAGE	29,360	88,985	4	4	4	47	48	48

ASSUMPTIONS: Drift Rate = 0.0002%
TDS ppm = 0.69 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1990
CALCULATED TOWER PERFORMANCE PARAMETERS - UNIT 3

SEPTEMBER DAY	Airflow /Tower. cu m/s Twr 01	Twr 02	Twr 03	Heat BTU/min	Calc TDS, ppm	CW Flow gpm	Calc Drift gpm	lb/min
1	10,128	10,128	10,128	2.15E+08	17,181	589,000	1.178	0.169
2	10,128	10,128	10,128	2.15E+08	17,733	589,000	1.178	0.174
3	10,128	10,128	10,128	2.15E+08	17,561	589,000	1.178	0.173
4	10,128	10,128	10,128	2.15E+08	17,457	589,000	1.178	0.172
5	10,128	10,128	10,128	2.15E+08	17,871	589,000	1.178	0.176
6	10,128	10,128	10,128	2.15E+08	20,459	589,000	1.178	0.201
7	10,128	10,128	10,128	2.15E+08	20,079	589,000	1.178	0.197
8	6,330	10,128	10,128	1.59E+08	20,252	589,000	1.031	0.174
9	10,128	10,128	10,128	1.52E+08	19,493	589,000	1.178	0.192
10	10,128	10,128	10,128	2.13E+08	19,907	589,000	1.178	0.196
11	10,128	10,128	10,128	2.15E+08	19,976	589,000	1.178	0.196
12	10,128	10,128	10,128	2.15E+08	21,632	589,000	1.178	0.213
13	10,128	10,128	10,128	2.15E+08	21,908	589,000	1.178	0.215
14	10,128	10,128	10,128	2.15E+08	23,081	589,000	1.178	0.227
15	10,128	10,128	10,128	2.15E+08	23,046	589,000	1.178	0.227
16	10,128	10,128	10,128	2.15E+08	21,321	589,000	1.178	0.210
17	10,128	10,128	10,128	2.15E+08	20,562	589,000	1.178	0.202
18	10,128	10,128	10,128	2.15E+08	21,356	589,000	1.178	0.210
19	10,128	10,128	10,128	2.12E+08	21,114	589,000	1.178	0.208
20	10,128	10,128	10,128	2.13E+08	21,183	589,000	1.178	0.208
21	10,128	10,128	10,128	2.15E+08	21,804	589,000	1.178	0.214
22	10,128	10,128	10,128	2.15E+08	20,459	589,000	1.178	0.201
23	10,128	10,128	10,128	2.15E+08	20,493	589,000	1.178	0.201
24	10,128	10,128	10,128	2.15E+08	20,562	589,000	1.178	0.202
25	10,128	10,128	10,128	2.15E+08	20,459	589,000	1.178	0.201
26	10,128	10,128	10,128	2.15E+08	20,217	589,000	1.178	0.199
27	10,128	10,128	10,128	2.15E+08	19,976	589,000	1.178	0.196
28	10,128	10,128	10,128	2.15E+08	20,148	589,000	1.178	0.198
29	10,128	10,128	10,128	2.12E+08	19,976	589,000	1.178	0.196
30	10,128	10,128	9,495	2.15E+08	20,493	589,000	1.153	0.197
AVERAGE	10,001	10,128	10,107	2.11E+08	20,258	589,000	1.172	0.198

ASSUMPTIONS: Drift Rate = 0.0002%
TDS ppm = 0.69 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1990
INPUT DATA - UNIT 3

OCTOBER	DAY	CW CONDUCTIVITY DATA umhos/cm	THERMAL GEN MWt/d	CW FLOW - No PUMPS/SHIFT Mids	Days	Swings	SUM - FANS OPER IN EA SHIFT Twr 01	Twr 02	Twr 03
	1	30,550	91,009	4	4	4	48	48	45
	2	30,000	90,881	4	4	4	48	48	45
	3	30,150	90,917	4	4	4	48	48	45
	4	30,200	90,936	4	4	4	48	48	45
	5	30,150	90,890	4	4	4	48	48	45
	6	30,200	90,926	4	4	4	48	48	46
	7	30,900	90,936	4	4	4	48	48	48
	8	30,100	90,890	4	4	4	48	48	48
	9	29,450	90,945	4	4	4	48	48	48
	10	26,850	90,908	4	4	4	48	48	48
	11	26,650	90,917	4	4	4	48	48	48
	12	26,150	90,954	4	4	4	48	48	48
	13	25,400	90,890	4	4	4	48	48	48
	14	24,700	90,908	4	4	4	48	48	48
	15	23,950	90,899	4	4	4	48	48	48
	16	23,455	90,917	4	4	4	48	48	48
	17	23,000	90,908	4	4	4	48	48	48
	18	22,150	90,899	4	4	4	48	48	48
	19	21,800	90,954	4	4	4	48	48	48
	20	20,850	49,257	4	4	4	40	40	39
	21	18,300	2,134	4	4	4	0	0	0
	22	17,750	30,908	4	4	4	17	5	0
	23	17,100	87,114	4	4	4	48	41	22
	24	19,800	90,872	4	4	4	48	48	48
	25	20,650	90,917	4	4	4	48	48	48
	26	23,300	90,908	4	4	4	48	48	48
	27	22,350	90,954	4	4	4	48	48	48
	28	22,650	90,899	4	4	4	48	48	48
	29	23,350	90,844	4	4	4	48	48	48
	30	23,100	90,872	4	4	4	48	48	48
	31	23,100	90,899	4	4	4	48	48	48
AVERAGE		24,778	84,647	4	4	4	45	45	43

ASSUMPTIONS: Drift Rate = 0.0002%
TDS ppm = 0.71 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1990
CALCULATED TOWER PERFORMANCE PARAMETERS - UNIT 3

OCTOBER	DAY	Airflow /Tower. cu m/s Twr 01	Twr 02	Twr 03	Heat BTU/min	Calc TDS, ppm	CW Flow gpm	Calc Drift gpm	lb/min
	1	10,128	10,128	9,495	2.16E+08	21,691	589,000	1.153	0.209
	2	10,128	10,128	9,495	2.15E+08	21,300	589,000	1.153	0.205
	3	10,128	10,128	9,495	2.15E+08	21,407	589,000	1.153	0.206
	4	10,128	10,128	9,495	2.16E+08	21,442	589,000	1.153	0.206
	5	10,128	10,128	9,495	2.15E+08	21,407	589,000	1.153	0.206
	6	10,128	10,128	9,706	2.15E+08	21,442	589,000	1.162	0.208
	7	10,128	10,128	10,128	2.16E+08	21,939	589,000	1.178	0.216
	8	10,128	10,128	10,128	2.15E+08	21,371	589,000	1.178	0.210
	9	10,128	10,128	10,128	2.16E+08	20,910	589,000	1.178	0.206
	10	10,128	10,128	10,128	2.15E+08	19,064	589,000	1.178	0.187
	11	10,128	10,128	10,128	2.15E+08	18,922	589,000	1.178	0.186
	12	10,128	10,128	10,128	2.16E+08	18,567	589,000	1.178	0.183
	13	10,128	10,128	10,128	2.15E+08	18,034	589,000	1.178	0.177
	14	10,128	10,128	10,128	2.15E+08	17,537	589,000	1.178	0.172
	15	10,128	10,128	10,128	2.15E+08	17,005	589,000	1.178	0.167
	16	10,128	10,128	10,128	2.15E+08	16,653	589,000	1.178	0.164
	17	10,128	10,128	10,128	2.15E+08	16,330	589,000	1.178	0.161
	18	10,128	10,128	10,128	2.15E+08	15,727	589,000	1.178	0.155
	19	10,128	10,128	10,128	2.16E+08	15,478	589,000	1.178	0.152
	20	8,440	8,440	8,229	1.17E+08	14,804	589,000	0.973	0.120
	21	0	0	0	5.06E+06	12,993	589,000	0.000	0.000
	22	3,587	1,055	0	7.33E+07	12,603	589,000	0.180	0.019
	23	10,128	8,651	4,642	2.06E+08	12,141	589,000	0.908	0.092
	24	10,128	10,128	10,128	2.15E+08	14,058	589,000	1.178	0.138
	25	10,128	10,128	10,128	2.15E+08	14,662	589,000	1.178	0.144
	26	10,128	10,128	10,128	2.15E+08	16,543	589,000	1.178	0.163
	27	10,128	10,128	10,128	2.16E+08	15,869	589,000	1.178	0.156
	28	10,128	10,128	10,128	2.15E+08	16,082	589,000	1.178	0.158
	29	10,128	10,128	10,128	2.15E+08	16,579	589,000	1.178	0.163
	30	10,128	10,128	10,128	2.15E+08	16,401	589,000	1.178	0.161
	31	10,128	10,128	10,128	2.15E+08	16,401	589,000	1.178	0.161
AVERAGE		9,536	9,407	9,121	2.01E+08	17,592	589,000	1.088	0.163

ASSUMPTIONS: Drift Rate = 0.0002%
TDS ppm = 0.71 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1990
INPUT DATA - UNIT 3

NOVEMBER DAY	CW CONDUCTIVITY DATA umhos/cm	THERMAL GEN MWt/d	CW FLOW - No PUMPS/SHIFT Mids	Days	Swings	SUM - FANS OPER IN EA SHIFT Twr 01	Twr 02	Twr 03
1	22,550	90,844	4	4	4	48	48	48
2	22,100	90,872	4	4	4	48	48	48
3	21,400	90,926	4	4	4	48	48	48
4	20,550	90,908	4	4	4	48	48	48
5	20,150	90,917	4	4	4	48	48	48
6	20,100	90,917	4	4	4	48	48	48
7	20,100	90,908	4	4	4	48	48	48
8	20,050	90,923	4	4	4	48	48	48
9	17,800	90,923	4	4	4	48	47	48
10	18,700	90,963	4	4	4	48	48	48
11	19,000	90,899	4	4	4	48	48	48
12	19,600	90,881	4	4	4	48	48	48
13	20,100	90,890	4	4	4	48	48	48
14	19,500	90,908	4	4	4	48	48	48
15	19,300	90,863	4	4	4	48	48	48
16	19,000	90,890	4	4	4	48	48	48
17	19,700	90,914	4	4	4	48	48	48
18	19,300	90,790	4	4	4	48	48	48
19	19,400	90,835	4	4	4	48	48	48
20	20,500	90,904	4	4	4	48	48	47
21	19,500	90,908	4	4	4	48	48	47
22	18,800	90,863	4	4	4	48	48	47
23	18,700	90,863	4	4	4	48	48	47
24	18,500	90,899	4	4	4	48	48	47
25	19,500	90,863	4	4	4	48	48	48
26	21,300	88,245	4	4	4	48	48	48
27	18,200	90,822	4	4	4	46	48	48
28	18,300	90,881	4	4	4	48	48	45
29	18,500	90,899	4	4	4	48	48	46
30	18,800	90,936	4	4	4	48	48	48
AVERAGE	19,633	90,802	4	4	4	48	48	48

ASSUMPTIONS: Drift Rate = 0.0002%
TDS ppm = 0.77 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1990
CALCULATED TOWER PERFORMANCE PARAMETERS - UNIT 3

	Airflow /Tower. cu m/s			Heat	Calc	CW Flow	Calc Drift	
NOVEMBER DAY	Twr 01	Twr 02	Twr 03	BTU/min	TDS, ppm	gpm	gpm	lb/min
1	10,128	10,128	10,128	2.15E+08	17,364	589,000	1.178	0.171
2	10,128	10,128	10,128	2.15E+08	17,017	589,000	1.178	0.167
3	10,128	10,128	10,128	2.15E+08	16,478	589,000	1.178	0.162
4	10,128	10,128	10,128	2.15E+08	15,824	589,000	1.178	0.156
5	10,128	10,128	10,128	2.15E+08	15,516	589,000	1.178	0.153
6	10,128	10,128	10,128	2.15E+08	15,477	589,000	1.178	0.152
7	10,128	10,128	10,128	2.15E+08	15,477	589,000	1.178	0.152
8	10,128	10,128	10,128	2.15E+08	15,439	589,000	1.178	0.152
9	10,128	9,917	10,128	2.15E+08	13,706	589,000	1.170	0.134
10	10,128	10,128	10,128	2.16E+08	14,399	589,000	1.178	0.142
11	10,128	10,128	10,128	2.15E+08	14,630	589,000	1.178	0.144
12	10,128	10,128	10,128	2.15E+08	15,092	589,000	1.178	0.148
13	10,128	10,128	10,128	2.15E+08	15,477	589,000	1.178	0.152
14	10,128	10,128	10,128	2.15E+08	15,015	589,000	1.178	0.148
15	10,128	10,128	10,128	2.15E+08	14,861	589,000	1.178	0.146
16	10,128	10,128	10,128	2.15E+08	14,630	589,000	1.178	0.144
17	10,128	10,128	10,128	2.15E+08	15,169	589,000	1.178	0.149
18	10,128	10,128	10,128	2.15E+08	14,861	589,000	1.178	0.146
19	10,128	10,128	10,128	2.15E+08	14,938	589,000	1.178	0.147
20	10,128	10,128	9,917	2.15E+08	15,785	589,000	1.170	0.154
21	10,128	10,128	9,917	2.15E+08	15,015	589,000	1.170	0.147
22	10,128	10,128	9,917	2.15E+08	14,476	589,000	1.170	0.141
23	10,128	10,128	9,917	2.15E+08	14,399	589,000	1.170	0.141
24	10,128	10,128	9,917	2.15E+08	14,245	589,000	1.170	0.139
25	10,128	10,128	10,128	2.15E+08	15,015	589,000	1.178	0.148
26	10,128	10,128	10,128	2.09E+08	16,401	589,000	1.178	0.161
27	9,706	10,128	10,128	2.15E+08	14,014	589,000	1.162	0.136
28	10,128	10,128	9,495	2.15E+08	14,091	589,000	1.153	0.136
29	10,128	10,128	9,706	2.15E+08	14,245	589,000	1.162	0.138
30	10,128	10,128	10,128	2.16E+08	14,476	589,000	1.178	0.142
AVERAGE	10,114	10,121	10,058	2.15E+08	15,118	589,000	1.174	0.148

ASSUMPTIONS: Drift Rate = 0.0002%
TDS ppm = 0.77 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1990
INPUT DATA - UNIT 3

DECEMBER DAY	CW CONDUCTIVITY DATA umhos/cm	THERMAL GEN MWt/d	CW FLOW - No PUMPS/SHIFT Mids	Days	Swings	SUM - FANS OPER IN EA SHIFT Twr 01	Twr 02	Twr 03
1	18,600	91,045	4	4	4	48	48	48
2	18,300	90,990	4	4	4	48	48	48
3	19,900	90,972	4	4	4	48	48	48
4	20,600	90,990	4	4	4	48	48	48
5	19,000	90,981	4	4	4	48	48	48
6	18,600	90,926	4	4	4	48	45	48
7	20,300	90,936	4	4	4	42	46	48
8	19,800	90,917	4	4	4	48	48	48
9	19,900	90,981	4	4	4	48	48	48
10	19,300	91,008	4	4	4	48	48	48
11	19,300	91,027	4	4	4	48	46	48
12	20,400	91,072	4	4	4	48	45	48
13	20,800	91,036	4	4	4	48	45	48
14	17,800	90,936	4	4	4	48	45	48
15	18,100	90,936	4	4	4	48	45	48
16	18,900	90,936	4	4	4	48	45	48
17	16,900	90,990	4	4	4	48	45	48
18	16,900	90,981	4	4	4	48	45	48
19	16,800	91,008	4	4	4	48	46	48
20	16,300	90,881	4	4	4	48	48	48
21	15,800	90,990	4	4	4	48	48	48
22	16,600	91,008	4	4	4	48	48	45
23	16,600	90,990	4	4	4	40	38	39
24	16,200	90,899	4	4	4	44	42	36
25	14,500	88,738	4	4	4	45	38	34
26	16,800	38,523	4	2	2	14	8	7
27	17,800	53,507	2	4	4	15	8	0
28	17,400	88,856	2	4	4	44	48	30
29	18,100	90,863	2	4	4	48	48	45
30	17,400	90,954	2	4	4	48	48	45
31	16,100	90,954	4	4	4	48	39	38
AVERAGE	18,058	87,930	4	4	4	45	43	43

ASSUMPTIONS: Drift Rate = 0.0002%
TDS ppm = 0.74 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

COOLING TOWER SOURCE TERM
FOR 1990
CALCULATED TOWER PERFORMANCE PARAMETERS - UNIT 3

	Airflow /Tower. cu m/s			Heat	Calc	CW Flow	Calc Drift	
DECEMBER DAY	Twr 01	Twr 02	Twr 03	BTU/min	TDS, ppm	gpm	gpm	lb/min
1	10,128	10,128	10,128	2.16E+08	13,764	589,000	1.178	0.135
2	10,128	10,128	10,128	2.16E+08	13,542	589,000	1.178	0.133
3	10,128	10,128	10,128	2.16E+08	14,726	589,000	1.178	0.145
4	10,128	10,128	10,128	2.16E+08	15,244	589,000	1.178	0.150
5	10,128	10,128	10,128	2.16E+08	14,060	589,000	1.178	0.138
6	10,128	9,495	10,128	2.15E+08	13,764	589,000	1.153	0.132
7	8,862	9,706	10,128	2.16E+08	15,022	589,000	1.113	0.139
8	10,128	10,128	10,128	2.15E+08	14,652	589,000	1.178	0.144
9	10,128	10,128	10,128	2.16E+08	14,726	589,000	1.178	0.145
10	10,128	10,128	10,128	2.16E+08	14,282	589,000	1.178	0.140
11	10,128	9,706	10,128	2.16E+08	14,282	589,000	1.162	0.138
12	10,128	9,495	10,128	2.16E+08	15,096	589,000	1.153	0.145
13	10,128	9,495	10,128	2.16E+08	15,392	589,000	1.153	0.148
14	10,128	9,495	10,128	2.16E+08	13,172	589,000	1.153	0.127
15	10,128	9,495	10,128	2.16E+08	13,394	589,000	1.153	0.129
16	10,128	9,495	10,128	2.16E+08	13,986	589,000	1.153	0.135
17	10,128	9,495	10,128	2.16E+08	12,506	589,000	1.153	0.120
18	10,128	9,495	10,128	2.16E+08	12,506	589,000	1.153	0.120
19	10,128	9,706	10,128	2.16E+08	12,432	589,000	1.162	0.121
20	10,128	10,128	10,128	2.15E+08	12,062	589,000	1.178	0.119
21	10,128	10,128	10,128	2.16E+08	11,692	589,000	1.178	0.115
22	10,128	10,128	9,495	2.16E+08	12,284	589,000	1.153	0.118
23	8,440	8,018	8,229	2.16E+08	12,284	589,000	0.957	0.098
24	9,284	8,862	7,596	2.15E+08	11,988	589,000	0.998	0.100
25	9,495	8,018	7,174	2.10E+08	10,730	589,000	0.957	0.086
26	2,954	1,688	1,477	9.13E+07	12,432	402,333	0.162	0.017
27	3,165	1,688	0	1.27E+08	13,172	495,667	0.158	0.017
28	9,284	10,128	6,330	2.11E+08	12,876	495,667	0.840	0.090
29	10,128	10,128	9,495	2.15E+08	13,394	495,667	0.971	0.108
30	10,128	10,128	9,495	2.16E+08	12,876	495,667	0.971	0.104
31	10,128	8,229	8,018	2.16E+08	11,914	589,000	1.023	0.102
AVERAGE	9,502	9,141	9,032	2.08E+08	13,363	570,935	1.053	0.118

ASSUMPTIONS: Drift Rate = 0.0002%
TDS ppm = 0.74 x Conductivity, umhos/cm
Airflow = 64.4 E 06 cfm/ 48 fans
CW Flow = (No pumps x 140,000) + 29,000 gpm

Appendix B

Cooling Tower Basin Water

Cooling tower basin water samples are usually collected once per month from the cooling tower basins of PVNGS Units 1-3. Sample collection is dependent upon each representative unit's operational status during the month. Presented in this appendix are the data on 31 parameters for those months of 1990 during which the units were operating: July through December for Unit 1; January, February, and June through December for Unit 2; and February through December for Unit 3. No sample was taken during April for either Units 1, 2, or 3. Values below the detectable limit of the laboratory procedure are preceded by minus signs. Missing data are represented by a field of "9s."

A R I Z O N A   P U B L I C   S E R V I C E

Cooling Tower Basin Water Sample Data

Lab Designation	9999-99999-9-9
Sponsor Designation	UNIT1
Cooling Tower	1
Sample Date	01/16/90

Determination (mg/l)	
Calcium, total	999
Magnesium, total	999.9
Sodium, total	9999
Chloride	9999
Sulfate (as SO4)	9999
Nitrate (as N)	999.9
Silica (as SiO2)	999
Phosphate	99.99
Fluoride	999.9
Potassium, total	999
Copper, total	99.999
Zinc, total	99.999
Iron, total	99.99
Arsenic, total	99.999
Boron	99.9
Ammonium	99.9
TSS (at 105 Deg C)	999
COD	9999
Alkalinity, total	999
TDS (at 180 Deg C)	99999
Silver, total	99.999
Barium, total	99.9
Cadmium, total	99.999
Chromium, total	99.999
Lead, total	99.999
Mercury, total	99.9999
Beryllium, total	99.999
Selenium, total	99.999
Manganese, total	99.999
Phenol	99.999
Conductivity mmhos/cm	99999

A R I Z O N A   P U B L I C   S E R V I C E

Cooling Tower Basin Water Sample Data

Lab Designation	8928-32904-1-1
Sponsor Designation	UNIT2
Cooling Tower	2
Sample Date	01/16/90

Determination (mg/l)	
Calcium, total	360
Magnesium, total	28.0
Sodium, total	4300
Chloride	4700
Sulfate (as SO4)	4100
Nitrate (as N)	250.0
Silica (as SiO2)	94
Phosphate	1.10
Fluoride	3.4
Potassium, total	190
Copper, total	0.052
Zinc, total	0.070
Iron, total	0.58
Arsenic, total	0.030
Boron	4.9
Ammonium	0.4
TSS (at 105 Deg C)	34
COD	410
Alkalinity, total	28
TDS (at 180 Deg C)	14000
Silver, total	-0.005
Barium, total	0.2
Cadmium, total	-0.005
Chromium, total	0.030
Lead, total	-0.025
Mercury, total	-0.0005
Beryllium, total	-0.005
Selenium, total	-0.050
Manganese, total	0.026
Phenol	0.010
Conductivity mmhos/cm	37000

A R I Z O N A   P U B L I C   S E R V I C E

Cooling Tower Basin Water Sample Data

Lab Designation	9999-99999-9-9
Sponsor Designation	UNIT3
Cooling Tower	3
Sample Date	01/16/90

Determination (mg/l)	
Calcium, total	999
Magnesium, total	999.9
Sodium, total	9999
Chloride	9999
Sulfate (as SO4)	9999
Nitrate (as N)	999.9
Silica (as SiO2)	999
Phosphate	99.99
Fluoride	999.9
Potassium, total	999
Copper, total	99.999
Zinc, total	99.999
Iron, total	99.99
Arsenic, total	99.999
Boron	99.9
Ammonium	99.9
TSS (at 105 Deg C)	999
COD	9999
Alkalinity, total	999
TDS (at 180 Deg C)	99999
Silver, total	99.999
Barium, total	99.9
Cadmium, total	99.999
Chromium, total	99.999
Lead, total	99.999
Mercury, total	99.9999
Beryllium, total	99.999
Selenium, total	99.999
Manganese, total	99.999
Phenol	99.999
Conductivity mmhos/cm	99999

A R I Z O N A   P U B L I C   S E R V I C E

Cooling Tower Basin Water Sample Data

Lab Designation	9999-99999-9-9
Sponsor Designation	UNIT1
Cooling Tower	1
Sample Date	02/15/90

Determination (mg/l)	
Calcium, total	999
Magnesium, total	999.9
Sodium, total	9999
Chloride	9999
Sulfate (as SO4)	9999
Nitrate (as N)	999.9
Silica (as SiO2)	999
Phosphate	99.99
Fluoride	999.9
Potassium, total	999
Copper, total	99.999
Zinc, total	99.999
Iron, total	99.99
Arsenic, total	99.999
Boron	99.9
Ammonium	99.9
TSS (at 105 Deg C)	999
COD	9999
Alkalinity, total	999
TDS (at 180 Deg C)	99999
Silver, total	99.999
Barium, total	99.9
Cadmium, total	99.999
Chromium, total	99.999
Lead, total	99.999
Mercury, total	99.9999
Beryllium, total	99.999
Selenium, total	99.999
Manganese, total	99.999
Phenol	99.999
Conductivity mmhos/cm	99999

A R I Z O N A   P U B L I C   S E R V I C E

Cooling Tower Basin Water Sample Data

Lab Designation	8928-33196-2-1
Sponsor Designation	UNIT2
Cooling Tower	2
Sample Date	02/15/90

Determination (mg/l)	
Calcium, total	420
Magnesium, total	30.0
Sodium, total	4500
Chloride	4200
Sulfate (as SO4)	3900
Nitrate (as N)	270.0
Silica (as SiO2)	75
Phosphate	2.30
Fluoride	10.0
Potassium, total	120
Copper, total	0.053
Zinc, total	0.071
Iron, total	0.69
Arsenic, total	0.014
Boron	4.4
Ammonium	0.4
TSS (at 105 Deg C)	67
COD	340
Alkalinity, total	20
TDS (at 180 Deg C)	13000
Silver, total	-0.005
Barium, total	0.1
Cadmium, total	-0.005
Chromium, total	0.028
Lead, total	-0.010
Mercury, total	0.0094
Beryllium, total	-0.005
Selenium, total	-0.050
Manganese, total	0.030
Phenol	0.010
Conductivity mmhos/cm	18000

A R I Z O N A P U B L I C S E R V I C E

Cooling Tower Basin Water Sample Data

Lab Designation	8928-33196-2-2
Sponsor Designation	UNIT3
Cooling Tower	3
Sample Date	02/15/90

Determination (mg/l)	
Calcium, total	470
Magnesium, total	32.0
Sodium, total	5100
Chloride	4500
Sulfate (as SO4)	4000
Nitrate (as N)	290.0
Silica (as SiO2)	81
Phosphate	2.20
Fluoride	13.0
Potassium, total	120
Copper, total	0.160
Zinc, total	0.110
Iron, total	0.92
Arsenic, total	0.013
Boron	5.0
Ammonium	0.4
TSS (at 105 Deg C)	72
COD	210
Alkalinity, total	25
TDS (at 180 Deg C)	15000
Silver, total	-0.005
Barium, total	0.1
Cadmium, total	-0.005
Chromium, total	0.030
Lead, total	-0.010
Mercury, total	0.0091
Beryllium, total	-0.005
Selenium, total	-0.050
Manganese, total	0.037
Phenol	0.012
Conductivity mmhos/cm	20000

A R I Z O N A   P U B L I C   S E R V I C E

Cooling Tower Basin Water Sample Data

Lab Designation	9999-99999-9-9
Sponsor Designation	UNIT1
Cooling Tower	1
Sample Date	03/15/90

Determination (mg/l)	
Calcium, total	999
Magnesium, total	999.9
Sodium, total	9999
Chloride	9999
Sulfate (as SO4)	9999
Nitrate (as N)	999.9
Silica (as SiO2)	999
Phosphate	99.99
Fluoride	999.9
Potassium, total	999
Copper, total	99.999
Zinc, total	99.999
Iron, total	99.99
Arsenic, total	99.999
Boron	99.9
Ammonium	99.9
TSS (at 105 Deg C)	999
COD	9999
Alkalinity, total	999
TDS (at 180 Deg C)	99999
Silver, total	99.999
Barium, total	99.9
Cadmium, total	99.999
Chromium, total	99.999
Lead, total	99.999
Mercury, total	99.9999
Beryllium, total	99.999
Selenium, total	99.999
Manganese, total	99.999
Phenol	99.999
Conductivity mmhos/cm	99999

A R I Z O N A P U B L I C S E R V I C E

Cooling Tower Basin Water Sample Data

Lab Designation	9999-99999-9-9
Sponsor Designation	UNIT2
Cooling Tower	2
Sample Date	03/15/90

Determination (mg/l)	
Calcium, total	999
Magnesium, total	999.9
Sodium, total	9999
Chloride	9999
Sulfate (as SO4)	9999
Nitrate (as N)	999.9
Silica (as SiO2)	999
Phosphate	99.99
Fluoride	999.9
Potassium, total	999
Copper, total	99.999
Zinc, total	99.999
Iron, total	99.99
Arsenic, total	99.999
Boron	99.9
Ammonium	99.9
TSS (at 105 Deg C)	999
COD	9999
Alkalinity, total	999
TDS (at 180 Deg C)	99999
Silver, total	99.999
Barium, total	99.9
Cadmium, total	99.999
Chromium, total	99.999
Lead, total	99.999
Mercury, total	99.9999
Beryllium, total	99.999
Selenium, total	99.999
Manganese, total	99.999
Phenol	99.999
Conductivity mmhos/cm	99999

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Cooling Tower Basin Water Sample Data

Lab Designation	8928-33474-1-1
Sponsor Designation	UNIT3
Cooling Tower	3
Sample Date	03/15/90

Determination (mg/l)	
Calcium, total	370
Magnesium, total	35.0
Sodium, total	3600
Chloride	3800
Sulfate (as SO4)	3700
Nitrate (as N)	290.0
Silica (as SiO2)	61
Phosphate	4.00
Fluoride	12.0
Potassium, total	180
Copper, total	0.065
Zinc, total	0.062
Iron, total	0.66
Arsenic, total	0.012
Boron	4.6
Ammonium	0.4
TSS (at 105 Deg C)	55
COD	420
Alkalinity, total	31
TDS (at 180 Deg C)	14000
Silver, total	-0.005
Barium, total	0.1
Cadmium, total	-0.005
Chromium, total	0.026
Lead, total	-0.100
Mercury, total	0.0078
Beryllium, total	-0.005
Selenium, total	-0.100
Manganese, total	0.034
Phenol	0.017
Conductivity mmhos/cm	22000

A R I Z O N A   P U B L I C   S E R V I C E

Cooling Tower Basin Water Sample Data

Lab Designation	9999-99999-9-9
Sponsor Designation	UNIT1
Cooling Tower	1
Sample Date	04/15/90

Determination (mg/l)	
Calcium, total	999
Magnesium, total	999.9
Sodium, total	9999
Chloride	9999
Sulfate (as SO4)	9999
Nitrate (as N)	999.9
Silica (as SiO2)	999
Phosphate	99.99
Fluoride	999.9
Potassium, total	999
Copper, total	99.999
Zinc, total	99.999
Iron, total	99.99
Arsenic, total	99.999
Boron	99.9
Ammonium	99.9
TSS (at 105 Deg C)	999
COD	9999
Alkalinity, total	999
TDS (at 180 Deg C)	99999
Silver, total	99.999
Barium, total	99.9
Cadmium, total	99.999
Chromium, total	99.999
Lead, total	99.999
Mercury, total	99.9999
Beryllium, total	99.999
Selenium, total	99.999
Manganese, total	99.999
Phenol	99.999
Conductivity mmhos/cm	99999

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Cooling Tower Basin Water Sample Data

Lab Designation	9999-99999-9-9
Sponsor Designation	UNIT2
Cooling Tower	2
Sample Date	04/15/90

Determination (mg/l)	
Calcium, total	999
Magnesium, total	999.9
Sodium, total	9999
Chloride	9999
Sulfate (as SO4)	9999
Nitrate (as N)	999.9
Silica (as SiO2)	999
Phosphate	99.99
Fluoride	999.9
Potassium, total	999
Copper, total	99.999
Zinc, total	99.999
Iron, total	99.99
Arsenic, total	99.999
Boron	99.9
Ammonium	99.9
TSS (at 105 Deg C)	999
COD	9999
Alkalinity, total	999
TDS (at 180 Deg C)	99999
Silver, total	99.999
Barium, total	99.9
Cadmium, total	99.999
Chromium, total	99.999
Lead, total	99.999
Mercury, total	99.9999
Beryllium, total	99.999
Selenium, total	99.999
Manganese, total	99.999
Phenol	99.999
Conductivity mmhos/cm	99999

A R I Z O N A   P U B L I C   S E R V I C E

Cooling Tower Basin Water Sample Data

Lab Designation	9999-99999-9-9
Sponsor Designation	UNIT3
Cooling Tower	3
Sample Date	04/15/90

Determination (mg/l)	
Calcium, total	999
Magnesium, total	999.9
Sodium, total	9999
Chloride	9999
Sulfate (as SO4)	9999
Nitrate (as N)	999.9
Silica (as SiO2)	999
Phosphate	99.99
Fluoride	999.9
Potassium, total	999
Copper, total	99.999
Zinc, total	99.999
Iron, total	99.99
Arsenic, total	99.999
Boron	99.9
Ammonium	99.9
TSS (at 105 Deg C)	999
COD	9999
Alkalinity, total	999
TDS (at 180 Deg C)	99999
Silver, total	99.999
Barium, total	99.9
Cadmium, total	99.999
Chromium, total	99.999
Lead, total	99.999
Mercury, total	99.9999
Beryllium, total	99.999
Selenium, total	99.999
Manganese, total	99.999
Phenol	99.999
Conductivity mmhos/cm	99999

A R I Z O N A   P U B L I C   S E R V I C E

Cooling Tower Basin Water Sample Data

Lab Designation	9999-99999-9-9
Sponsor Designation	UNIT1
Cooling Tower	1
Sample Date	05/15/90

Determination (mg/l)	
Calcium, total	999
Magnesium, total	999.9
Sodium, total	9999
Chloride	9999
Sulfate (as SO4)	9999
Nitrate (as N)	999.9
Silica (as SiO2)	999
Phosphate	99.99
Fluoride	999.9
Potassium, total	999
Copper, total	99.999
Zinc, total	99.999
Iron, total	99.99
Arsenic, total	99.999
Boron	99.9
Ammonium	99.9
TSS (at 105 Deg C)	999
COD	9999
Alkalinity, total	999
TDS (at 180 Deg C)	99999
Silver, total	99.999
Barium, total	99.9
Cadmium, total	99.999
Chromium, total	99.999
Lead, total	99.999
Mercury, total	99.9999
Beryllium, total	99.999
Selenium, total	99.999
Manganese, total	99.999
Phenol	99.999
Conductivity mmhos/cm	99999

A R I Z O N A   P U B L I C   S E R V I C E

Cooling Tower Basin Water Sample Data

Lab Designation	9999-99999-9-9
Sponsor Designation	UNIT2
Cooling Tower	2
Sample Date	05/15/90

Determination (mg/l)	
Calcium, total	999
Magnesium, total	999.9
Sodium, total	9999
Chloride	9999
Sulfate (as SO4)	9999
Nitrate (as N)	999.9
Silica (as SiO2)	999
Phosphate	99.99
Fluoride	999.9
Potassium, total	999
Copper, total	99.999
Zinc, total	99.999
Iron, total	99.99
Arsenic, total	99.999
Boron	99.9
Ammonium	99.9
TSS (at 105 Deg C)	999
COD	9999
Alkalinity, total	999
TDS (at 180 Deg C)	99999
Silver, total	99.999
Barium, total	99.9
Cadmium, total	99.999
Chromium, total	99.999
Lead, total	99.999
Mercury, total	99.9999
Beryllium, total	99.999
Selenium, total	99.999
Manganese, total	99.999
Phenol	99.999
Conductivity mmhos/cm	99999

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Cooling Tower Basin Water Sample Data

Lab Designation	8928-34158-1-1
Sponsor Designation	UNIT3
Cooling Tower	3
Sample Date	05/15/90

Determination (mg/l)	
Calcium, total	380
Magnesium, total	24.0
Sodium, total	5100
Chloride	5800
Sulfate (as SO4)	4500
Nitrate (as N)	300.0
Silica (as SiO2)	66
Phosphate	1.30
Fluoride	16.0
Potassium, total	190
Copper, total	0.094
Zinc, total	0.058
Iron, total	0.83
Arsenic, total	-0.025
Boron	4.7
Ammonium	0.6
TSS (at 105 Deg C)	60
COD	600
Alkalinity, total	29
TDS (at 180 Deg C)	17000
Silver, total	-0.005
Barium, total	0.1
Cadmium, total	-0.005
Chromium, total	0.033
Lead, total	-0.005
Mercury, total	-0.0010
Beryllium, total	-0.005
Selenium, total	-0.050
Manganese, total	0.030
Phenol	0.008
Conductivity mmhos/cm	33000

A R I Z O N A   P U B L I C   S E R V I C E

Cooling Tower Basin Water Sample Data

Lab Designation	8928-34389-2-1
Sponsor Designation	UNIT1
Cooling Tower	1
Sample Date	06/07/90

Determination (mg/l)	
Calcium, total	999
Magnesium, total	999.9
Sodium, total	9999
Chloride	9999
Sulfate (as SO4)	9999
Nitrate (as N)	999.9
Silica (as SiO2)	999
Phosphate	99.99
Fluoride	999.9
Potassium, total	999
Copper, total	99.999
Zinc, total	99.999
Iron, total	99.99
Arsenic, total	99.999
Boron	99.9
Ammonium	99.9
TSS (at 105 Deg C)	999
COD	9999
Alkalinity, total	999
TDS (at 180 Deg C)	99999
Silver, total	99.999
Barium, total	99.9
Cadmium, total	99.999
Chromium, total	99.999
Lead, total	99.999
Mercury, total	99.9999
Beryllium, total	99.999
Selenium, total	99.999
Manganese, total	99.999
Phenol	99.999
Conductivity mmhos/cm	99999

A R I Z O N A   P U B L I C   S E R V I C E

Cooling Tower Basin Water Sample Data

Lab Designation	8928-34389-2-1
Sponsor Designation	UNIT2
Cooling Tower	2
Sample Date	06/07/90

Determination (mg/l)	
Calcium, total	140
Magnesium, total	7.8
Sodium, total	1200
Chloride	1300
Sulfate (as SO4)	1200
Nitrate (as N)	53.0
Silica (as SiO2)	12
Phosphate	0.60
Fluoride	5.0
Potassium, total	61
Copper, total	0.045
Zinc, total	0.120
Iron, total	0.38
Arsenic, total	-0.010
Boron	1.6
Ammonium	0.9
TSS (at 105 Deg C)	7
COD	180
Alkalinity, total	-5
TDS (at 180 Deg C)	4200
Silver, total	-0.005
Barium, total	0.1
Cadmium, total	-0.005
Chromium, total	0.005
Lead, total	-0.010
Mercury, total	-0.0010
Beryllium, total	-0.005
Selenium, total	-0.010
Manganese, total	0.017
Phenol	-0.002
Conductivity mmhos/cm	6500

A R I Z O N A P U B L I C S E R V I C E

Cooling Tower Basin Water Sample Data

Lab Designation	8928-34389-2-2
Sponsor Designation	UNIT3
Cooling Tower	3
Sample Date	06/07/90

Determination (mg/l)	
Calcium, total	420
Magnesium, total	18.0
Sodium, total	5200
Chloride	6400
Sulfate (as SO4)	4300
Nitrate (as N)	210.0
Silica (as SiO2)	29
Phosphate	0.88
Fluoride	17.0
Potassium, total	220
Copper, total	0.077
Zinc, total	0.032
Iron, total	0.72
Arsenic, total	-0.025
Boron	4.5
Ammonium	0.7
TSS (at 105 Deg C)	42
COD	560
Alkalinity, total	25
TDS (at 180 Deg C)	17000
Silver, total	-0.005
Barium, total	0.1
Cadmium, total	-0.005
Chromium, total	0.026
Lead, total	-0.050
Mercury, total	-0.0010
Beryllium, total	-0.005
Selenium, total	-0.050
Manganese, total	0.020
Phenol	0.003
Conductivity mmhos/cm	27000

A R I Z O N A   P U B L I C   S E R V I C E

Cooling Tower Basin Water Sample Data

Lab Designation	8928-34848-3-1
Sponsor Designation	UNIT1
Cooling Tower	1
Sample Date	07/16/90

Determination (mg/l)	
Calcium, total	340
Magnesium, total	17.0
Sodium, total	6300
Chloride	6200
Sulfate (as SO4)	3800
Nitrate (as N)	180.0
Silica (as SiO2)	50
Phosphate	0.93
Fluoride	19.0
Potassium, total	200
Copper, total	0.270
Zinc, total	0.090
Iron, total	2.20
Arsenic, total	0.014
Boron	5.1
Ammonium	0.5
TSS (at 105 Deg C)	64
COD	460
Alkalinity, total	25
TDS (at 180 Deg C)	18000
Silver, total	-0.005
Barium, total	0.2
Cadmium, total	-0.005
Chromium, total	0.050
Lead, total	-0.010
Mercury, total	0.0003
Beryllium, total	-0.005
Selenium, total	-0.010
Manganese, total	0.080
Phenol	-0.002
Conductivity mmhos/cm	40000

A R I Z O N A   P U B L I C   S E R V I C E

Cooling Tower Basin Water Sample Data

Lab Designation	8928-34848-3-2
Sponsor Designation	UNIT2
Cooling Tower	2
Sample Date	07/16/90

Determination (mg/l)	
Calcium, total	160
Magnesium, total	8.7
Sodium, total	1700
Chloride	1700
Sulfate (as SO4)	1400
Nitrate (as N)	60.0
Silica (as SiO2)	23
Phosphate	0.89
Fluoride	8.2
Potassium, total	78
Copper, total	0.180
Zinc, total	0.081
Iron, total	1.20
Arsenic, total	0.006
Boron	2.4
Ammonium	0.2
TSS (at 105 Deg C)	36
COD	100
Alkalinity, total	18
TDS (at 180 Deg C)	5700
Silver, total	-0.005
Barium, total	-0.1
Cadmium, total	-0.005
Chromium, total	0.023
Lead, total	-0.005
Mercury, total	0.0002
Beryllium, total	-0.005
Selenium, total	-0.050
Manganese, total	0.045
Phenol	-0.002
Conductivity mmhos/cm	12000

A R I Z O N A   P U B L I C   S E R V I C E

Cooling Tower Basin Water Sample Data

Lab Designation	8928-34848-3-3
Sponsor Designation	UNIT3
Cooling Tower	3
Sample Date	07/16/90

Determination (mg/l)	
Calcium, total	270
Magnesium, total	12.0
Sodium, total	6000
Chloride	6400
Sulfate (as SO4)	3100
Nitrate (as N)	190.0
Silica (as SiO2)	42
Phosphate	0.52
Fluoride	17.0
Potassium, total	190
Copper, total	0.089
Zinc, total	0.031
Iron, total	0.63
Arsenic, total	0.013
Boron	4.1
Ammonium	0.4
TSS (at 105 Deg C)	38
COD	110
Alkalinity, total	20
TDS (at 180 Deg C)	17000
Silver, total	-0.005
Barium, total	0.1
Cadmium, total	-0.005
Chromium, total	0.025
Lead, total	-0.025
Mercury, total	0.0004
Beryllium, total	-0.005
Selenium, total	-0.010
Manganese, total	0.018
Phenol	-0.002
Conductivity mmhos/cm	30000

A R I Z O N A P U B L I C S E R V I C E

Cooling Tower Basin Water Sample Data

Lab Designation	8928-35175-3-1
Sponsor Designation	UNIT1
Cooling Tower	. 1
Sample Date	08/16/90

Determination (mg/l)	
Calcium, total	410
Magnesium, total	18.0
Sodium, total	5900
Chloride	7400
Sulfate (as SO4)	4100
Nitrate (as N)	220.0
Silica (as SiO2)	42
Phosphate	0.40
Fluoride	18.0
Potassium, total	250
Copper, total	0.090
Zinc, total	0.100
Iron, total	0.77
Arsenic, total	0.017
Boron	5.2
Ammonium	0.4
TSS (at 105 Deg C)	40
COD	250
Alkalinity, total	27
TDS (at 180 Deg C)	18000
Silver, total	-0.005
Barium, total	0.2
Cadmium, total	0.005
Chromium, total	0.025
Lead, total	-0.100
Mercury, total	0.0001
Beryllium, total	-0.005
Selenium, total	-0.250
Manganese, total	0.041
Phenol	0.009
Conductivity mmhos/cm	30000

ARIZONA PUBLIC SERVICE

Cooling Tower Basin Water Sample Data

Lab Designation	8928-35175-3-2
Sponsor Designation	UNIT2
Cooling Tower	2
Sample Date	08/16/90

Determination (mg/l)	
Calcium, total	500
Magnesium, total	21.0
Sodium, total	7100
Chloride	8200
Sulfate (as SO4)	4300
Nitrate (as N)	250.0
Silica (as SiO2)	46
Phosphate	0.80
Fluoride	21.0
Potassium, total	290
Copper, total	0.099
Zinc, total	0.120
Iron, total	1.50
Arsenic, total	0.015
Boron	6.0
Ammonium	0.5
TSS (at 105 Deg C)	46
COD	290
Alkalinity, total	38
TDS (at 180 Deg C)	26000
Silver, total	-0.005
Barium, total	0.2
Cadmium, total	-0.005
Chromium, total	0.034
Lead, total	-0.050
Mercury, total	0.0003
Beryllium, total	-0.005
Selenium, total	-0.250
Manganese, total	0.052
Phenol	0.008
Conductivity mmhos/cm	33000

A R I Z O N A   P U B L I C   S E R V I C E

Cooling Tower Basin Water Sample Data

Lab Designation	8928-35175-3-3
Sponsor Designation	UNIT3
Cooling Tower	3
Sample Date	08/16/90

Determination (mg/l)	
Calcium, total	470
Magnesium, total	20.0
Sodium, total	6500
Chloride	8800
Sulfate (as SO4)	4400
Nitrate (as N)	240.0
Silica (as SiO2)	45
Phosphate	0.60
Fluoride	20.0
Potassium, total	260
Copper, total	0.088
Zinc, total	0.061
Iron, total	0.91
Arsenic, total	0.014
Boron	5.7
Ammonium	0.4
TSS (at 105 Deg C)	56
COD	230
Alkalinity, total	32
TDS (at 180 Deg C)	32000
Silver, total	-0.005
Barium, total	0.2
Cadmium, total	-0.005
Chromium, total	0.031
Lead, total	-0.050
Mercury, total	0.0003
Beryllium, total	-0.005
Selenium, total	-0.100
Manganese, total	0.036
Phenol	0.006
Conductivity mmhos/cm	38000

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Cooling Tower Basin Water Sample Data

Lab Designation	8928-35586-3-1
Sponsor Designation	UNIT1
Cooling Tower	1
Sample Date	09/19/90

Determination (mg/l)	
Calcium, total	390
Magnesium, total	16.0
Sodium, total	5000
Chloride	6300
Sulfate (as SO4)	4000
Nitrate (as N)	220.0
Silica (as SiO2)	75
Phosphate	0.55
Fluoride	17.0
Potassium, total	230
Copper, total	0.054
Zinc, total	0.073
Iron, total	0.51
Arsenic, total	0.014
Boron	5.0
Ammonium	0.3
TSS (at 105 Deg C)	26
COD	410
Alkalinity, total	26
TDS (at 180 Deg C)	18000
Silver, total	-0.005
Barium, total	0.1
Cadmium, total	-0.005
Chromium, total	0.022
Lead, total	-0.050
Mercury, total	0.0002
Beryllium, total	-0.005
Selenium, total	-0.050
Manganese, total	0.015
Phenol	-0.005
Conductivity mmhos/cm	33000

A R I Z O N A   P U B L I C   S E R V I C E

Cooling Tower Basin Water Sample Data

Lab Designation	8928-35586-3-2
Sponsor Designation	UNIT2
Cooling Tower	2
Sample Date	09/19/90

Determination (mg/l)	
Calcium, total	430
Magnesium, total	17.0
Sodium, total	6400
Chloride	7500
Sulfate (as SO4)	3700
Nitrate (as N)	240.0
Silica (as SiO2)	85
Phosphate	0.58
Fluoride	20.0
Potassium, total	270
Copper, total	0.044
Zinc, total	0.067
Iron, total	0.74
Arsenic, total	0.014
Boron	5.4
Ammonium	0.4
TSS (at 105 Deg C)	24
COD	450
Alkalinity, total	20
TDS (at 180 Deg C)	19000
Silver, total	-0.005
Barium, total	0.2
Cadmium, total	-0.005
Chromium, total	0.029
Lead, total	-0.050
Mercury, total	0.0002
Beryllium, total	-0.005
Selenium, total	-0.100
Manganese, total	0.024
Phenol	-0.005
Conductivity mmhos/cm	36000

A R I Z O N A   P U B L I C   S E R V I C E

Cooling Tower Basin Water Sample Data

Lab Designation	8928-35586-3-3
Sponsor Designation	UNIT3
Cooling Tower	3
Sample Date	09/19/90

Determination (mg/l)	
Calcium, total	460
Magnesium, total	19.0
Sodium, total	6100
Chloride	8200
Sulfate (as SO4)	4000
Nitrate (as N)	270.0
Silica (as SiO2)	110
Phosphate	0.66
Fluoride	19.0
Potassium, total	250
Copper, total	0.069
Zinc, total	0.040
Iron, total	0.65
Arsenic, total	0.014
Boron	5.8
Ammonium	0.3
TSS (at 105 Deg C)	30
COD	460
Alkalinity, total	26
TDS (at 180 Deg C)	21000
Silver, total	-0.005
Barium, total	0.2
Cadmium, total	-0.005
Chromium, total	0.027
Lead, total	-0.100
Mercury, total	0.0002
Beryllium, total	-0.005
Selenium, total	-0.250
Manganese, total	0.021
Phenol	-0.005
Conductivity mmhos/cm	39000

A R I Z O N A   P U B L I C   S E R V I C E

Cooling Tower Basin Water Sample Data

Lab Designation	8928-35908-3-1
Sponsor Designation	UNIT1
Cooling Tower	1
Sample Date	10/15/90

Determination (mg/l)	
Calcium, total	500
Magnesium, total	25.0
Sodium, total	6400
Chloride	7800
Sulfate (as SO4)	4200
Nitrate (as N)	250.0
Silica (as SiO2)	94
Phosphate	0.88
Fluoride	22.0
Potassium, total	380
Copper, total	0.064
Zinc, total	0.072
Iron, total	0.64
Arsenic, total	-0.020
Boron	5.9
Ammonium	0.5
TSS (at 105 Deg C)	68
COD	490
Alkalinity, total	22
TDS (at 180 Deg C)	20000
Silver, total	-0.005
Barium, total	0.2
Cadmium, total	-0.005
Chromium, total	0.030
Lead, total	-0.025
Mercury, total	0.0002
Beryllium, total	-0.005
Selenium, total	-0.025
Manganese, total	0.026
Phenol	0.011
Conductivity mmhos/cm	32000

A R I Z O N A   P U B L I C   S E R V I C E

Cooling Tower Basin Water Sample Data

Lab Designation	8928-35908-3-2
Sponsor Designation	UNIT2
Cooling Tower	2
Sample Date	10/15/90

Determination (mg/l)	
Calcium, total	460
Magnesium, total	24.0
Sodium, total	6100
Chloride	7900
Sulfate (as SO4)	4200
Nitrate (as N)	260.0
Silica (as SiO2)	92
Phosphate	0.84
Fluoride	21.0
Potassium, total	370
Copper, total	0.046
Zinc, total	0.055
Iron, total	0.48
Arsenic, total	-0.020
Boron	5.7
Ammonium	0.4
TSS (at 105 Deg C)	44
COD	560
Alkalinity, total	28
TDS (at 180 Deg C)	20000
Silver, total	-0.005
Barium, total	0.2
Cadmium, total	-0.005
Chromium, total	0.030
Lead, total	-0.025
Mercury, total	0.0003
Beryllium, total	-0.005
Selenium, total	-0.025
Manganese, total	0.020
Phenol	0.007
Conductivity mmhos/cm	37000

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Cooling Tower Basin Water Sample Data

Lab Designation	8928-35908-3-3
Sponsor Designation	UNIT3
Cooling Tower	3
Sample Date	10/15/90

Determination (mg/l)	
Calcium, total	400
Magnesium, total	21.0
Sodium, total	5200
Chloride	6400
Sulfate (as SO4)	3400
Nitrate (as N)	220.0
Silica (as SiO2)	79
Phosphate	0.75
Fluoride	19.0
Potassium, total	300
Copper, total	0.044
Zinc, total	0.031
Iron, total	0.43
Arsenic, total	-0.020
Boron	4.9
Ammonium	0.3
TSS (at 105 Deg C)	36
COD	390
Alkalinity, total	24
TDS (at 180 Deg C)	17000
Silver, total	-0.005
Barium, total	0.2
Cadmium, total	-0.005
Chromium, total	0.027
Lead, total	-0.025
Mercury, total	0.0003
Beryllium, total	-0.005
Selenium, total	-0.025
Manganese, total	0.019
Phenol	0.007
Conductivity mmhos/cm	31000

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Cooling Tower Basin Water Sample Data

Lab Designation	8928-36275-3-1
Sponsor Designation	UNIT1
Cooling Tower	1
Sample Date	11/14/90

Determination (mg/l)	
Calcium, total	320
Magnesium, total	27.0
Sodium, total	5800
Chloride	6900
Sulfate (as SO4)	4400
Nitrate (as N)	290.0
Silica (as SiO2)	56
Phosphate	1.00
Fluoride	22.0
Potassium, total	340
Copper, total	0.070
Zinc, total	0.060
Iron, total	0.65
Arsenic, total	-0.100
Boron	6.1
Ammonium	0.5
TSS (at 105 Deg C)	67
COD	370
Alkalinity, total	29
TDS (at 180 Deg C)	22000
Silver, total	-0.005
Barium, total	0.2
Cadmium, total	-0.005
Chromium, total	0.034
Lead, total	-0.025
Mercury, total	0.0002
Beryllium, total	-0.005
Selenium, total	-0.100
Manganese, total	0.025
Phenol	0.008
Conductivity mmhos/cm	36000

A R I Z O N A   P U B L I C   S E R V I C E

Cooling Tower Basin Water Sample Data

Lab Designation	8928-36275-3-2
Sponsor Designation	UNIT2
Cooling Tower	2
Sample Date	11/14/90

Determination (mg/l)	
Calcium, total	430
Magnesium, total	28.0
Sodium, total	6300
Chloride	7500
Sulfate (as SO4)	4200
Nitrate (as N)	280.0
Silica (as SiO2)	55
Phosphate	1.00
Fluoride	21.0
Potassium, total	340
Copper, total	0.053
Zinc, total	0.049
Iron, total	0.67
Arsenic, total	-0.100
Boron	6.2
Ammonium	2.2
TSS (at 105 Deg C)	56
COD	380
Alkalinity, total	29
TDS (at 180 Deg C)	20000
Silver, total	-0.005
Barium, total	0.2
Cadmium, total	-0.005
Chromium, total	0.037
Lead, total	-0.020
Mercury, total	0.0002
Beryllium, total	-0.005
Selenium, total	-0.100
Manganese, total	0.029
Phenol	0.006
Conductivity mmhos/cm	40000

A R I Z O N A   P U B L I C   S E R V I C E

Cooling Tower Basin Water Sample Data

Lab Designation	8928-36275-3-3
Sponsor Designation	UNIT3
Cooling Tower	3
Sample Date	11/14/90

Determination (mg/l)	
Calcium, total	310
Magnesium, total	21.0
Sodium, total	4600
Chloride	5300
Sulfate (as SO4)	3000
Nitrate (as N)	210.0
Silica (as SiO2)	42
Phosphate	0.78
Fluoride	16.0
Potassium, total	240
Copper, total	0.046
Zinc, total	0.024
Iron, total	0.47
Arsenic, total	-0.100
Boron	4.6
Ammonium	0.4
TSS (at 105 Deg C)	36
COD	320
Alkalinity, total	29
TDS (at 180 Deg C)	15000
Silver, total	-0.005
Barium, total	0.1
Cadmium, total	-0.005
Chromium, total	0.024
Lead, total	-0.020
Mercury, total	-0.0010
Beryllium, total	-0.005
Selenium, total	-0.100
Manganese, total	0.023
Phenol	0.006
Conductivity mmhos/cm	29000

A R I Z O N A   P U B L I C   S E R V I C E

Cooling Tower Basin Water Sample Data

Lab Designation	8928-36604-3-1
Sponsor Designation	UNIT1
Cooling Tower	1
Sample Date	12/12/90

Determination (mg/l)	
Calcium, total	480
Magnesium, total	30.0
Sodium, total	6100
Chloride	5900
Sulfate (as SO4)	3900
Nitrate (as N)	330.0
Silica (as SiO2)	94
Phosphate	1.20
Fluoride	21.0
Potassium, total	300
Copper, total	0.068
Zinc, total	0.051
Iron, total	0.57
Arsenic, total	-0.025
Boron	5.7
Ammonium	0.9
TSS (at 105 Deg C)	-5
COD	420
Alkalinity, total	29
TDS (at 180 Deg C)	18000
Silver, total	-0.005
Barium, total	0.1
Cadmium, total	-0.005
Chromium, total	0.021
Lead, total	-0.025
Mercury, total	0.0001
Beryllium, total	-0.005
Selenium, total	-0.200
Manganese, total	0.020
Phenol	0.007
Conductivity mmhos/cm	33000

A R I Z O N A   P U B L I C   S E R V I C E

Cooling Tower Basin Water Sample Data

Lab Designation	8928-36604-3-2
Sponsor Designation	UNIT2
Cooling Tower	2
Sample Date	12/12/90

Determination (mg/l)	
Calcium, total	490
Magnesium, total	33.0
Sodium, total	6000
Chloride	6000
Sulfate (as SO4)	3500
Nitrate (as N)	320.0
Silica (as SiO2)	96
Phosphate	1.30
Fluoride	20.0
Potassium, total	290
Copper, total	0.068
Zinc, total	0.058
Iron, total	0.75
Arsenic, total	-0.025
Boron	5.9
Ammonium	1.3
TSS (at 105 Deg C)	38
COD	520
Alkalinity, total	36
TDS (at 180 Deg C)	19000
Silver, total	-0.005
Barium, total	0.1
Cadmium, total	-0.005
Chromium, total	0.024
Lead, total	-0.025
Mercury, total	0.0003
Beryllium, total	-0.005
Selenium, total	-0.200
Manganese, total	0.023
Phenol	-0.005
Conductivity mmhos/cm	29000

A R I Z O N A   P U B L I C   S E R V I C E

Cooling Tower Basin Water Sample Data

Lab Designation	8928-36604-3-3
Sponsor Designation	UNIT3
Cooling Tower	3
Sample Date	12/12/90

Determination (mg/l)	
Calcium, total	390
Magnesium, total	27.0
Sodium, total	4800
Chloride	4800
Sulfate (as SO4)	2800
Nitrate (as N)	270.0
Silica (as SiO2)	86
Phosphate	1.00
Fluoride	15.0
Potassium, total	250
Copper, total	0.050
Zinc, total	0.035
Iron, total	0.53
Arsenic, total	-0.025
Boron	4.7
Ammonium	1.2
TSS (at 105 Deg C)	29
COD	400
Alkalinity, total	36
TDS (at 180 Deg C)	15000
Silver, total	-0.005
Barium, total	0.1
Cadmium, total	-0.005
Chromium, total	0.019
Lead, total	-0.025
Mercury, total	0.0002
Beryllium, total	-0.005
Selenium, total	-0.050
Manganese, total	0.021
Phenol	0.008
Conductivity mmhos/cm	26000

Appendix C
Dustfall Data

This appendix presents all the airborne salt drift deposition data obtained during the period January through December 1990 at the 48 PVNGS monitoring sites (sites 1-28, 30-45, and 80-83).

Drift deposition samples were collected each month and analyzed for the concentration of ions of interest by Accu-Labs Research, Inc., in Golden, Colorado.

NUS converted the laboratory results for each of the two collocated samplers to average deposition rates in pounds per acre per month based on the collection jar surface area and each sample's collection period and water volume. No corrections were applied to the deposition rates to account for the presence of ions in the collection water at the beginning of the sampling period. Except for bicarbonate, the concentrations of these ions in the water were below the detection limits of the laboratory analytical methods for the monitoring program, and their presence did not contribute to the calculation of significant deposition rates. The solubility of bicarbonate in a sample is influenced more by the pH, the ambient temperature, and the presence of other ions in the sample than by the initial concentration in the collection water.

The deposition rates were tabulated by location for each of the 12 months. The attached monthly data tables present the calculated deposition rates for each of the selected ions and for total suspended solids. In the column to the right of each monthly chemical deposition rate is a value, identified as "d," which is the absolute difference between the two samples at each location. If one of the samples was missing or invalid, a field of "9s" appears in the "d" column. If both samples were missing or invalid, a field of "9s" appears in all positions for that location. Those values reported as below the detection limit are included at one-half the detection limit value.

For each location, a mean for the values of "d" and a corresponding standard deviation were determined to assess the precision of the measurements.

Arithmetic means and the standard deviations of the arithmetic means were determined for each ion as an aid in assessing the calculated deposition rates. The significant figures listed for the means and the standard deviations were determined by the computer data field lengths assigned to the chemical; they do not represent the accuracy of the measurements.

For those ions reported as below the laboratory detection limit, a value of one-half the laboratory detection limit was used to calculate the mean of the collocated samples. In those cases in which both collocated samples are reported as below the laboratory detection limit, the absolute difference between the two samples, "d," represents the difference of the reported normalized sample volumes.

Included in a comments table for each month's samples are significant comments on the validity of the analyzed samples or on special conditions at the monitoring locations. For the 12-month period, there were 5 occasions in which neither sample at a location produced valid data. There were also 24 occasions in which one sample at a location was invalidated; either the jars were knocked over by cattle or the sample itself was contaminated by birds or insects. The overall deposition sample recovery rate for the period January 1990 through December 1990 was 97 percent.

The sample data have been reviewed for data entry errors and for consistency of paired samples and consistency of samples collected at similar locations. Contaminated samples have been identified and those values removed from the tables.

ARIZONA PUBLIC SERVICE

MONTHLY REPORT for 1-90

AVERAGE DEPOSITION DATA (Pounds per Acre - 30 Days)

and Differences (d)

Location Number	Na	d	K	d	Ca	d	Mg	d	Cl	d	F	d	SO4	d	NO3	d
001	0.546	0.04	0.079	0.02	0.546	0.04	0.123	0.04	0.344	0.16	0.396	0.09	0.793	0.17	0.064	0.04
002	0.481	0.08	0.117	0.06	0.641	0.11	0.184	0.02	0.240	0.04	0.401	0.07	0.801	0.14	0.166	0.02
003	0.509	0.01	0.128	0.09	0.594	0.18	0.136	0.00	0.254	0.01	0.424	0.01	0.848	0.02	0.042	0.00
004	0.438	0.17	0.132	0.09	0.790	0.19	0.149	0.02	0.394	0.26	0.439	0.01	0.877	0.01	0.184	0.01
005	0.509	0.02	0.126	0.08	0.678	0.02	0.144	0.01	0.254	0.01	0.424	0.01	0.848	0.03	0.105	0.12
006	0.484	0.03	0.120	0.07	0.645	0.03	0.192	0.09	0.360	0.22	0.403	0.02	0.806	0.04	0.123	0.16
007	0.460	0.18	0.092	0.00	0.644	0.18	0.083	0.02	0.276	0.00	0.460	0.00	0.921	0.00	0.046	0.00
008	0.423	0.20	0.168	0.01	0.503	0.04	0.187	0.12	0.252	0.02	0.419	0.04	0.839	0.07	0.042	0.00
009	0.459	0.26	0.132	0.07	0.805	0.04	0.136	0.04	0.271	0.05	0.452	0.08	0.903	0.15	0.045	0.01
010	0.358	0.07	0.073	0.02	0.730	0.15	0.130	0.00	0.448	0.41	0.365	0.08	0.730	0.15	0.099	0.12
011	0.508	0.02	0.169	0.01	1.269	0.12	0.356	0.05	0.254	0.01	0.423	0.02	0.847	0.03	0.161	0.01
012	0.394	0.09	0.190	0.20	0.627	0.20	0.160	0.23	0.241	0.04	0.401	0.07	0.802	0.15	0.169	0.05
013	0.461	0.19	0.138	0.09	1.106	0.37	0.240	0.07	0.277	0.00	0.461	0.00	0.922	0.00	0.046	0.00
014	0.718	0.11	0.119	0.07	0.481	0.04	0.111	0.06	0.558	0.12	0.401	0.03	0.801	0.06	0.090	0.10
015	0.355	0.00	0.089	0.00	0.444	0.18	0.044	0.00	0.266	0.00	0.444	0.00	0.888	0.01	0.044	0.00
016	0.655	0.03	0.074	0.01	0.668	0.26	0.103	0.02	0.508	0.06	0.368	0.06	0.735	0.13	0.087	0.09
017	0.332	0.01	0.083	0.00	0.416	0.18	0.062	0.04	0.249	0.01	0.415	0.01	0.829	0.03	0.041	0.00
018	0.303	0.02	0.076	0.01	0.376	0.12	0.038	0.00	0.227	0.02	0.379	0.03	0.758	0.05	0.144	0.00
019	0.315	0.04	0.079	0.01	0.555	0.22	0.065	0.05	1.018	0.04	0.393	0.04	0.786	0.09	0.131	0.06
020	1.038	0.24	0.149	0.01	0.745	0.04	0.147	0.11	0.894	0.05	0.372	0.02	0.745	0.04	0.157	0.24
0[illegible]	0.486	0.11	0.126	0.11	0.810	0.18	0.133	0.09	0.243	0.05	0.405	0.09	0.810	0.18	0.081	0.09
0[illegible]	0.350	0.04	0.134	0.10	0.700	0.08	0.140	0.02	0.262	0.03	0.438	0.05	0.875	0.10	0.138	0.05
023	0.565	0.14	0.968	0.28	6.069	0.20	1.587	0.62	0.441	0.38	0.405	0.02	0.810	0.04	0.121	0.01
024	0.584	0.22	0.166	0.01	1.081	0.26	0.265	0.01	0.249	0.02	0.415	0.04	0.829	0.07	0.041	0.00
025	0.330	0.03	0.338	0.36	1.241	0.28	0.628	0.47	0.248	0.02	0.413	0.04	0.825	0.08	0.041	0.00
026	0.513	0.03	0.086	0.00	0.601	0.20	0.094	0.02	0.381	0.23	0.428	0.02	0.855	0.05	0.088	0.09
027	0.488	0.00	0.081	0.00	0.814	0.01	0.155	0.05	0.488	0.00	0.407	0.00	0.814	0.01	0.102	0.12
028	0.318	0.01	0.080	0.00	0.796	0.03	0.119	0.07	0.239	0.01	0.398	0.02	0.796	0.03	0.076	0.07
030	0.400	0.17	0.241	0.17	1.594	0.06	0.447	0.05	0.356	0.23	0.398	0.02	0.797	0.03	0.112	0.04
031	0.370	0.00	0.093	0.00	0.741	0.00	0.176	0.13	0.278	0.00	0.463	0.00	0.926	0.00	0.097	0.10
032	0.392	0.00	0.098	0.00	0.882	0.19	0.137	0.04	0.294	0.00	0.490	0.01	0.980	0.01	0.049	0.00
033	0.362	0.01	0.091	0.00	0.816	0.21	0.100	0.02	0.272	0.01	0.453	0.01	0.905	0.03	0.096	0.10
034	0.333	0.02	0.083	0.01	0.666	0.04	0.091	0.01	0.250	0.02	0.416	0.03	0.832	0.05	0.042	0.00
035	0.362	999.99	0.090	999.99	0.723	999.99	0.090	999.99	0.271	999.99	0.452	999.99	0.904	999.99	0.045	999.99
036	0.317	0.00	0.079	0.00	0.633	0.00	0.095	0.00	0.238	0.00	0.396	0.00	0.792	0.00	0.158	0.03
037	0.250	0.17	0.083	0.00	0.415	0.16	0.062	0.04	0.249	0.00	0.415	0.01	0.830	0.01	0.062	0.04
038	0.249	0.17	0.083	0.00	0.331	0.00	0.041	0.00	0.248	0.00	0.414	0.00	0.827	0.01	0.041	0.00
039	0.238	0.17	0.079	0.00	0.315	0.01	0.039	0.00	0.236	0.01	0.394	0.02	0.788	0.03	0.039	0.00
040	0.354	0.01	0.133	0.09	0.708	0.02	0.130	0.17	0.266	0.01	0.443	0.01	0.885	0.03	0.085	0.08
041	0.413	0.16	0.083	0.00	0.828	0.02	0.166	0.04	0.497	0.01	0.414	0.01	0.828	0.02	0.157	0.01
042	0.313	0.04	0.078	0.01	0.470	0.05	0.058	0.03	0.235	0.03	0.392	0.04	0.783	0.09	0.072	0.06
043	0.344	0.03	0.254	0.15	0.516	0.05	0.196	0.07	0.258	0.02	0.430	0.04	0.859	0.08	0.043	0.00
044	0.524	0.02	0.087	0.00	0.524	0.02	0.105	0.04	0.485	0.45	0.437	0.02	0.874	0.03	0.074	0.06
045	0.379	0.10	0.077	0.01	0.840	0.03	0.149	0.10	0.231	0.03	0.384	0.05	0.769	0.11	0.100	0.13
080	1.047	0.07	0.120	0.07	1.209	0.06	0.200	0.10	0.886	0.09	0.404	0.03	0.808	0.07	0.145	0.21
081	1.837	0.26	0.160	0.01	1.195	0.10	0.207	0.02	1.596	0.08	0.399	0.02	1.596	0.08	0.137	0.19
082	0.856	0.04	0.115	0.06	2.015	0.34	0.314	0.16	0.700	0.06	0.392	0.05	0.783	0.11	0.039	0.01
0[illegible]	1.070	0.11	0.165	0.01	1.730	0.08	0.321	0.03	0.990	0.05	0.413	0.02	0.825	0.04	0.256	0.03
Ar.Mean	0.496	0.08	0.137	0.05	0.886	0.12	0.188	0.07	0.395	0.07	0.416	0.03	0.848	0.06	0.094	0.06
Std.Dev.	0.277	0.08	0.133	0.08	0.841	0.10	0.233	0.11	0.271	0.11	0.027	0.02	0.122	0.05	0.050	0.06

ARIZONA PUBLIC SERVICE
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AVERAGE DEPOSITION DATA (Pounds per Acre - 30 Days)
and Differences (d)

Location Number	PO4	d	CO3	d	HCO3	d	NH3	d	TSS	d	CU	d	Av d	SD(d)
001	0.016	0.00	3.964	0.86	3.964	0.86	0.159	0.03	6.435	4.08	0.079	0.02	0.46	1.08
002	0.016	0.00	4.005	0.70	4.005	0.70	0.160	0.03	8.027	7.35	0.080	0.01	0.67	1.94
003	0.017	0.00	4.240	0.08	4.240	0.08	0.170	0.00	7.236	6.08	0.085	0.00	0.47	1.62
004	0.018	0.00	4.385	0.06	4.385	0.06	0.175	0.00	9.244	9.78	0.088	0.00	0.76	2.60
005	0.017	0.00	4.240	0.15	4.240	0.15	0.170	0.01	8.983	9.63	0.085	0.00	0.73	2.56
006	0.016	0.00	4.031	0.21	4.031	0.21	0.397	0.46	16.827	7.19	0.081	0.00	0.62	1.89
007	0.018	0.00	4.604	0.02	4.604	0.02	0.184	0.00	4.604	0.02	0.092	0.00	0.03	0.06
008	0.017	0.00	4.193	0.36	4.193	0.36	0.168	0.01	18.521	4.96	0.084	0.01	0.44	1.31
009	0.018	0.00	4.516	0.76	4.516	0.76	0.181	0.03	9.901	11.53	0.090	0.02	0.99	3.05
010	0.015	0.00	3.651	0.76	3.651	0.76	0.146	0.03	7.956	0.21	0.073	0.02	0.20	0.26
011	0.017	0.00	4.234	0.16	4.234	0.16	0.253	0.16	22.050	4.20	0.085	0.00	0.35	1.11
012	0.016	0.00	4.010	0.73	4.010	0.73	0.379	0.41	15.458	9.92	0.080	0.01	0.92	2.60
013	0.018	0.00	4.609	0.01	4.609	0.01	0.184	0.00	11.516	13.80	0.092	0.00	1.04	3.67
014	0.016	0.00	4.005	0.30	4.005	0.30	0.160	0.01	6.703	5.09	0.080	0.01	0.45	1.34
015	0.018	0.00	4.438	0.04	4.438	0.04	0.178	0.00	4.438	0.04	0.089	0.00	0.02	0.05
016	0.015	0.00	3.677	0.65	3.677	0.65	0.147	0.03	5.354	2.71	0.074	0.01	0.34	0.72
017	0.017	0.00	4.146	0.13	4.146	0.13	0.166	0.01	4.146	0.13	0.083	0.00	0.05	0.06
018	0.015	0.00	3.792	0.27	3.792	0.27	0.152	0.01	3.792	0.27	0.076	0.01	0.08	0.11
019	0.016	0.00	3.932	0.45	3.932	0.45	0.157	0.02	10.921	1.89	0.079	0.01	0.24	0.50
020	0.015	0.00	3.724	0.22	3.724	0.22	0.149	0.01	16.167	13.93	0.074	0.00	1.08	[illegible]
021	0.016	0.00	4.052	0.92	4.052	0.92	0.162	0.04	19.817	10.88	0.081	0.02	0.98	[illegible]
022	0.018	0.00	4.375	0.50	4.375	0.50	0.175	0.02	24.700	9.80	0.088	0.01	0.81	2.[illegible]
023	0.058	0.08	4.050	0.19	21.060	1.00	0.162	0.01	140.053	67.81	0.081	0.00	5.06	18.06
024	0.017	0.00	4.146	0.35	4.146	0.35	0.166	0.01	29.567	10.72	0.083	0.01	0.86	2.84
025	0.017	0.00	4.125	0.39	4.125	0.39	0.165	0.02	54.990	28.19	0.083	0.01	2.16	7.49
026	0.017	0.00	4.276	0.24	4.276	0.24	0.171	0.01	17.104	0.96	0.086	0.00	0.15	0.25
027	0.024	0.02	4.068	0.03	4.068	0.03	0.163	0.00	14.625	9.65	0.081	0.00	0.71	2.57
028	0.016	0.00	3.980	0.16	3.980	0.16	0.159	0.01	20.666	2.35	0.080	0.00	0.21	0.62
030	0.016	0.00	3.984	0.16	3.984	0.16	0.159	0.01	40.938	31.87	0.080	0.00	2.35	8.50
031	0.019	0.00	4.630	0.01	4.630	0.01	0.185	0.00	13.418	17.56	0.093	0.00	1.27	4.69
032	0.020	0.00	4.901	0.05	4.901	0.05	0.196	0.00	25.454	11.49	0.098	0.00	0.85	3.06
033	0.018	0.00	4.526	0.14	4.526	0.14	0.181	0.01	17.185	1.30	0.091	0.00	0.14	0.34
034	0.017	0.00	4.161	0.26	4.161	0.26	0.166	0.01	10.794	0.99	0.083	0.01	0.12	0.26
035	0.018	999.99	4.521	999.99	4.521	999.99	0.181	999.99	4.521	999.99	0.090	999.99	999.99	999.99
036	0.016	0.00	3.958	0.02	3.958	0.02	0.158	0.00	84.029	85.94	0.079	0.00	6.15	22.97
037	0.017	0.00	4.151	0.05	4.151	0.05	0.166	0.00	18.213	16.38	0.083	0.00	1.21	4.37
038	0.017	0.00	4.136	0.04	4.136	0.04	0.165	0.00	18.207	3.50	0.083	0.00	0.27	0.93
039	0.016	0.00	3.938	0.15	3.938	0.15	0.158	0.01	11.565	15.41	0.079	0.00	1.14	4.11
040	0.018	0.00	4.427	0.13	4.427	0.13	0.177	0.01	14.753	20.78	0.089	0.00	1.53	5.54
041	0.017	0.00	4.141	0.09	4.141	0.09	0.166	0.00	13.213	6.32	0.083	0.00	0.48	1.68
042	0.016	0.00	3.915	0.44	3.915	0.44	0.157	0.02	7.980	7.69	0.078	0.01	0.64	2.03
043	0.042	0.05	4.296	0.41	4.296	0.41	1.031	0.10	16.857	12.11	0.086	0.01	0.97	3.21
044	0.017	0.00	4.370	0.16	4.370	0.16	0.175	0.01	9.091	9.29	0.087	0.00	0.73	2.46
045	0.015	0.00	3.844	0.54	3.844	0.54	0.154	0.02	18.233	3.55	0.077	0.01	0.37	0.93
080	0.016	0.00	4.042	0.33	4.042	0.33	0.162	0.01	19.267	4.87	0.081	0.01	0.45	1.28
081	0.016	0.00	3.990	0.21	3.990	0.21	0.160	0.01	15.875	5.55	0.080	0.00	0.48	1.46
082	0.016	0.00	3.917	0.54	7.198	6.02	0.157	0.02	27.550	14.90	0.078	0.01	1.59	[illegible]
083	0.017	0.00	4.125	0.21	4.125	0.21	0.165	0.01	23.267	14.37	0.083	0.00	1.08	[illegible]
Ar.Mean	0.018	0.00	4.155	0.29	4.578	0.42	0.195	0.03	19.379	11.43	0.083	0.01	0.91	3.05
Std.dev.	0.007	0.01	0.267	0.25	2.483	0.88	0.132	0.09	22.499	15.71	0.005	0.00	1.13	4.19

ARIZONA PUBLIC SERVICE
MONTHLY REPORT for 1-90

DEPOSITION DATA
Comments and Messages Only

Location Number	Sample A Comments	Sample B Comments	Processing Messages
001			
002			
003			
004			
005			
006			
007			
008			
009			
010			
011			
012			
013			
014			
015			
016			
017			
018			
019			
020			
[illegible]			
[illegible]			
023			
024			
025			
026			
027			
028			
030			
031			
032			
033			
034			
035	VOID/POSSIBLE CONTAMINATION		MISSING SAMPLE A
036			
037			
038			
039			
040			
041			
042			
043			
044			
045			
080			
081			
082			
[illegible]			

A R I Z O N A   P U B L I C   S E R V I C E

MONTHLY REPORT for 2-90

AVERAGE DEPOSITION DATA (Pounds per Acre - 30 Days)
and Differences (d)

Location Number	Na	d	K	d	Ca	d	Mg	d	Cl	d	F	d	SO4	d	NO3	d
001	0.484	0.38	0.242	0.19	0.948	0.12	0.218	0.07	0.237	0.03	0.395	0.05	0.790	0.10	0.077	0.08
002	0.420	0.52	0.250	0.18	0.993	0.40	0.298	0.12	0.247	0.02	0.411	0.03	0.822	0.06	0.085	0.08
003	0.315	0.03	0.308	0.28	1.013	0.38	0.464	0.30	0.236	0.02	0.394	0.04	0.788	0.07	0.039	0.00
004	0.170	0.00	0.254	0.17	0.509	0.00	0.229	0.15	0.254	0.00	0.424	0.00	0.848	0.00	0.042	0.00
005	0.214	0.25	0.173	0.01	0.608	0.19	0.200	0.09	0.260	0.01	0.433	0.01	0.867	0.03	0.043	0.00
006	0.246	0.16	0.192	0.05	0.903	0.16	0.230	0.07	0.205	0.08	0.342	0.14	0.684	0.28	0.055	0.05
007	0.358	0.37	0.267	0.19	0.976	0.22	0.396	0.18	0.266	0.01	0.443	0.02	0.885	0.03	0.083	0.08
008	0.379	0.01	0.190	0.00	0.759	0.02	0.228	0.08	0.284	0.01	0.474	0.01	0.948	0.02	0.047	0.00
009	0.422	0.12	0.171	0.02	1.266	0.37	0.407	0.06	0.256	0.03	0.427	0.05	0.853	0.09	0.043	0.00
010	0.311	0.01	0.156	0.01	0.934	0.04	0.281	0.07	0.233	0.01	0.389	0.01	0.778	0.03	0.039	0.00
011	0.394	0.13	0.317	0.02	1.580	0.21	0.529	0.08	0.238	0.02	0.396	0.03	0.793	0.05	0.040	0.00
012	0.336	0.02	0.336	0.02	1.346	0.09	0.506	0.13	0.252	0.02	0.421	0.03	0.841	0.05	0.062	0.04
013	0.752	0.04	0.376	0.02	1.316	0.07	0.415	0.10	0.282	0.01	0.470	0.02	0.940	0.05	0.047	0.00
014	0.361	0.01	0.180	0.00	1.172	0.20	0.334	0.02	0.270	0.00	0.451	0.01	0.901	0.01	0.045	0.00
015	0.367	0.03	0.183	0.02	0.734	0.07	0.177	0.14	0.275	0.02	0.459	0.04	0.917	0.08	0.046	0.00
016	0.419	0.04	0.140	0.01	0.632	0.19	0.190	0.09	0.210	0.02	0.350	0.03	0.699	0.06	0.112	0.04
017	0.339	0.04	0.170	0.02	0.509	0.06	0.234	0.11	0.254	0.03	0.424	0.05	0.848	0.09	0.042	0.00
018	0.324	0.02	0.162	0.01	0.648	0.05	0.180	0.11	0.243	0.02	0.405	0.03	0.810	0.06	0.041	0.00
019	0.316	0.01	0.235	0.15	1.104	0.03	0.417	0.13	0.237	0.01	0.394	0.01	0.789	0.02	0.039	0.00
020	1.059	0.09	0.163	0.01	0.738	0.22	0.197	0.05	0.817	0.06	0.408	0.03	0.817	0.06	0.068	0.05
021	0.334	999.99	0.167	999.99	0.836	999.99	0.201	999.99	0.251	999.99	0.418	999.99	0.836	999.99	0.042	999.99
022	0.167	0.00	0.167	0.00	0.669	0.02	0.218	0.04	0.251	0.01	0.418	0.01	0.836	0.02	0.042	0.00
023	0.928	0.20	2.622	1.27	12.890	0.62	3.795	0.64	0.253	0.01	0.421	0.01	0.842	0.03	0.124	0.16
024	0.522	0.34	0.347	0.34	1.570	0.31	0.574	0.37	0.262	0.01	0.437	0.01	0.873	0.02	0.044	0.00
025	0.452	0.16	0.182	0.01	0.815	0.14	0.272	0.01	0.272	0.01	0.454	0.02	0.908	0.04	0.078	0.07
026	0.995	0.54	0.633	0.18	1.086	0.01	0.190	0.02	1.086	0.36	0.453	0.00	0.905	0.01	0.077	0.06
027	0.505	999.99	0.168	999.99	0.841	999.99	0.042	999.99	0.252	999.99	0.421	999.99	0.841	999.99	0.042	999.99
028	0.406	0.19	0.161	0.01	0.806	0.06	0.212	0.11	0.242	0.02	0.403	0.03	0.806	0.06	0.060	0.04
030	0.399	0.15	0.320	0.01	1.759	0.26	0.496	0.08	0.240	0.01	0.400	0.01	0.801	0.03	0.077	0.07
031	0.406	0.13	0.163	0.01	0.902	0.23	0.261	0.02	0.245	0.02	0.408	0.03	0.817	0.06	0.061	0.04
032	0.394	0.03	0.299	0.22	1.677	0.32	0.367	0.16	0.295	0.02	0.492	0.04	0.984	0.07	0.049	0.00
033	0.497	0.33	0.332	0.00	0.913	0.15	0.524	0.22	0.249	0.00	0.415	0.01	0.830	0.01	0.079	0.08
034	0.242	0.14	0.164	0.02	0.571	0.11	0.179	0.05	0.246	0.02	0.410	0.04	0.821	0.08	0.076	0.07
035	0.289	0.18	0.194	0.01	0.775	0.02	0.308	0.18	0.290	0.01	0.484	0.01	0.968	0.03	0.048	0.00
036	0.339	0.01	0.170	0.01	0.592	0.15	0.227	0.14	0.254	0.01	0.424	0.02	0.848	0.03	0.088	0.09
037	1.143	1.48	0.666	0.93	0.772	0.34	0.395	0.23	0.292	0.02	0.486	0.03	0.972	0.06	0.049	0.00
038	0.302	0.05	0.151	0.02	0.593	0.21	0.152	0.05	0.227	0.03	0.378	0.06	0.755	0.11	0.083	0.09
039	0.336	0.02	0.254	0.18	0.585	0.13	0.185	0.01	0.252	0.02	0.420	0.03	0.839	0.05	0.111	0.14
040	0.358	0.36	0.269	0.18	0.806	0.18	0.206	0.09	0.269	0.00	0.448	0.00	0.896	0.00	0.045	0.00
041	0.158	0.02	0.158	0.02	0.792	0.10	0.233	0.13	0.237	0.03	0.396	0.05	0.792	0.10	0.110	0.02
042	0.335	0.03	0.167	0.02	0.749	0.10	0.274	0.06	0.251	0.02	0.418	0.04	0.837	0.08	0.094	0.10
043	0.745	0.12	0.830	0.05	1.717	0.21	0.624	0.12	1.060	0.30	0.155	0.03	0.310	0.05	0.148	0.08
044	0.367	0.36	0.185	0.00	0.738	0.02	0.212	0.05	0.277	0.01	0.461	0.01	0.923	0.02	0.046	0.00
045	0.399	0.11	0.162	0.02	0.809	0.11	0.170	0.04	0.243	0.03	0.404	0.05	0.809	0.11	0.059	0.03
080	0.480	0.02	0.160	0.01	1.595	0.24	0.319	0.02	0.363	0.26	0.400	0.02	0.800	0.04	0.096	0.04
081	1.116	0.05	0.462	0.38	1.198	0.21	0.354	0.27	1.048	0.18	0.374	0.07	1.156	0.95	0.089	0.10
082	0.563	0.15	0.161	0.00	1.774	0.05	0.316	0.19	0.361	0.23	0.403	0.01	0.806	0.02	0.116	0.15
083	0.611	1.04	0.125	0.07	3.130	0.21	0.739	0.09	1.011	0.24	0.425	0.04	0.849	0.08	0.042	0.00
Ar.Mean	0.454	0.18	0.298	0.12	1.263	0.16	0.379	0.12	0.336	0.05	0.415	0.03	0.839	0.08	0.066	0.04
Std.Dev.	0.239	0.28	0.371	0.24	1.778	0.13	0.523	0.11	0.234	0.09	0.050	0.02	0.110	0.14	0.027	0.04

A R I Z O N A P U B L I C S E R V I C E

MONTHLY REPORT for 2-90

AVERAGE DEPOSITION DATA (Pounds per Acre - 30 Days)
and Differences (d)

Location Number	PO4	d	CO3	d	HCO3	d	NH3	d	TSS	d	CU	d	Av d	SD(d)
001	0.016	0.00	3.951	0.51	3.951	0.51	0.158	0.02	22.762	1.79	0.079	0.01	0.28	0.47
002	0.016	0.00	4.112	0.29	4.112	0.29	0.164	0.01	24.611	1.52	0.082	0.01	0.25	0.40
003	0.016	0.00	3.938	0.38	3.938	0.38	0.158	0.01	42.000	18.00	0.079	0.01	1.42	4.77
004	0.017	0.00	4.239	0.01	4.239	0.01	0.170	0.00	13.559	6.74	0.085	0.00	0.51	1.79
005	0.017	0.00	4.333	0.15	4.333	0.15	0.173	0.01	4.333	0.15	0.087	0.00	0.08	0.09
006	0.014	0.01	3.422	1.38	3.422	1.38	0.137	0.06	26.813	7.58	0.068	0.03	0.82	2.00
007	0.018	0.00	4.426	0.17	4.426	0.17	0.177	0.01	27.217	21.94	0.089	0.00	1.67	5.83
008	0.019	0.00	4.741	0.11	4.741	0.11	0.190	0.00	18.879	14.74	0.095	0.00	1.08	3.93
009	0.017	0.00	4.266	0.47	4.266	0.47	0.171	0.02	15.263	1.73	0.085	0.01	0.25	0.46
010	0.016	0.00	3.891	0.15	3.891	0.15	0.156	0.01	10.923	3.52	0.078	0.00	0.29	0.93
011	0.016	0.00	3.964	0.27	3.964	0.27	0.159	0.01	20.561	1.78	0.079	0.01	0.20	0.46
012	0.017	0.00	4.205	0.27	4.205	0.27	0.168	0.01	42.107	6.04	0.084	0.01	0.50	1.60
013	0.019	0.00	4.701	0.24	4.701	0.24	0.188	0.01	22.661	8.68	0.094	0.00	0.68	2.30
014	0.018	0.00	4.507	0.07	4.507	0.07	0.180	0.00	23.448	3.95	0.090	0.00	0.31	1.05
015	0.018	0.00	4.587	0.42	4.587	0.42	0.183	0.02	7.653	5.72	0.092	0.01	0.50	1.51
016	0.014	0.00	3.496	0.29	3.496	0.29	0.140	0.01	7.503	8.31	0.070	0.01	0.67	2.20
017	0.017	0.00	4.239	0.47	4.239	0.47	0.170	0.02	34.950	19.80	0.085	0.01	1.51	5.27
018	0.016	0.00	4.051	0.31	4.051	0.31	0.162	0.01	8.677	9.56	0.081	0.01	0.75	2.54
019	0.016	0.00	3.944	0.12	3.944	0.12	0.158	0.00	33.107	2.14	0.079	0.00	0.20	0.56
020	0.016	0.00	4.085	0.29	4.085	0.29	0.163	0.01	7.047	6.22	0.082	0.01	0.53	[illegible]
021	0.017	999.99	4.179	999.99	4.179	999.99	0.167	999.99	16.714	999.99	0.084	999.99	999.99	[illegible]
022	0.017	0.00	4.179	0.11	4.179	0.11	0.167	0.00	15.868	1.26	0.084	0.00	0.11	[illegible]
023	0.208	0.25	4.212	0.15	41.263	0.24	0.168	0.01	362.973	96.91	0.084	0.00	7.18	25.83
024	0.035	0.04	4.366	0.11	4.366	0.11	0.175	0.00	22.910	36.98	0.087	0.00	2.76	9.85
025	0.018	0.00	4.540	0.21	4.540	0.21	0.182	0.01	9.417	9.54	0.091	0.00	0.75	2.53
026	0.018	0.00	4.527	0.03	4.527	0.03	0.363	0.36	4.527	0.03	0.091	0.00	0.12	0.18
027	0.084	999.99	4.205	999.99	4.205	999.99	0.168	999.99	4.205	999.99	0.084	999.99	999.99	999.99
028	0.016	0.00	4.031	0.32	4.031	0.32	0.161	0.01	8.642	9.54	0.081	0.01	0.77	2.53
030	0.016	0.00	4.004	0.13	4.004	0.13	0.160	0.01	22.425	0.75	0.080	0.00	0.12	0.20
031	0.016	0.00	4.085	0.29	4.085	0.29	0.163	0.01	14.882	10.86	0.082	0.01	0.86	2.88
032	0.020	0.00	4.922	0.36	4.922	0.36	0.197	0.01	23.191	21.89	0.098	0.01	1.68	5.82
033	0.017	0.00	4.152	0.05	4.152	0.05	0.250	0.17	44.936	30.47	0.083	0.00	2.25	8.12
034	0.016	0.00	4.105	0.42	4.105	0.42	0.164	0.02	6.833	5.04	0.082	0.01	0.46	1.33
035	0.019	0.00	4.842	0.15	4.842	0.15	0.194	0.01	23.180	7.04	0.097	0.00	0.56	1.87
036	0.034	0.04	4.239	0.17	4.239	0.17	0.170	0.01	30.659	14.82	0.085	0.00	1.12	3.94
037	0.029	0.02	4.862	0.29	4.862	0.29	0.194	0.01	50.089	28.05	0.147	0.11	2.28	7.43
038	0.031	0.03	3.776	0.57	3.776	0.57	0.151	0.02	15.103	2.28	0.076	0.01	0.29	0.60
039	0.017	0.00	4.196	0.27	4.196	0.27	0.168	0.01	11.803	4.12	0.084	0.01	0.38	1.08
040	0.018	0.00	4.480	0.01	4.480	0.01	0.179	0.00	19.698	17.86	0.090	0.00	1.34	4.76
041	0.016	0.00	3.958	0.50	3.958	0.50	0.307	0.28	20.084	13.25	0.079	0.01	1.07	3.51
042	0.017	0.00	4.183	0.40	4.183	0.40	0.167	0.02	15.140	4.79	0.084	0.01	0.43	1.26
043	0.006	0.00	1.552	0.26	7.448	1.24	0.163	0.21	60.362	15.83	0.031	0.01	1.32	4.19
044	0.018	0.00	4.614	0.12	4.614	0.12	0.185	0.00	16.538	10.64	0.092	0.00	0.81	2.83
045	0.016	0.00	4.045	0.54	4.045	0.54	0.162	0.02	7.063	6.57	0.081	0.01	0.58	1.73
080	0.016	0.00	3.998	0.20	3.998	0.20	0.160	0.01	17.630	4.08	0.119	0.07	0.37	1.07
081	0.186	0.34	3.743	0.66	3.743	0.66	0.557	0.84	46.232	37.82	0.116	0.09	3.04	10.01
082	0.032	0.03	4.031	0.11	4.031	0.11	0.161	0.00	16.211	13.33	0.081	0.00	1.03	[illegible]
083	0.017	0.00	4.246	0.40	7.077	5.26	0.170	0.02	43.993	2.61	0.085	0.01	0.72	[illegible]
Ar.Mean	0.027	0.02	4.153	0.29	5.107	0.42	0.185	0.05	28.445	12.09	0.086	0.01	0.98	3.23
Std.dev.	0.038	0.06	0.500	0.23	5.375	0.78	0.066	0.14	51.065	15.85	0.015	0.02	1.17	4.21

DEPOSITION DATA
Comments and Messages Only

Location Number	Sample A Comments	Sample B Comments	Processing Messages
001			
002			
003			
004			
005			
006			
007			
008			
009			
010			
011			
012			
013			
014			
015			
016			
017			
018			
019			
020			
[illegible]	VOID/DEAD LIZARD IN CONTAINER		MISSING SAMPLE A
0[illegible]			
023			
024			
025			
026			
027	VOID/DEAD LIZARD IN CONTAINER		MISSING SAMPLE A
028			
030			
031			
032			
033			
034			
035			
036			
037			
038			
039			
040			
041			
042			
043	LIQUID GREEN	LIQUID GREEN	
044			
045			
080			
081			
08[illegible]			
0[illegible]			

ARIZONA PUBLIC SERVICE
MONTHLY REPORT for 3-90

AVERAGE DEPOSITION DATA (Pounds per Acre - 30 Days)
and Differences (d)

Location Number	Na	d	K	d	Ca	d	Mg	d	Cl	d	F	d	SO4	d	NO3	d
001	0.207	0.00	0.173	0.07	1.016	0.16	0.407	0.10	0.129	0.05	0.216	0.09	0.431	0.18	0.075	0.10
002	0.498	0.57	0.127	0.03	0.839	0.11	0.381	0.18	0.137	0.06	0.229	0.10	0.458	0.20	0.048	0.06
003	0.322	0.02	0.228	0.01	1.492	0.33	0.627	0.15	0.294	0.04	0.167	0.06	0.333	0.11	0.081	0.13
004	0.237	0.16	0.118	0.08	0.945	0.14	0.307	0.01	0.118	0.00	0.197	0.00	0.394	0.01	0.201	0.04
005	0.190	0.07	0.114	0.08	1.179	0.10	0.297	0.10	0.208	0.19	0.190	0.00	0.380	0.01	0.074	0.11
006	0.185	0.04	0.127	0.09	1.001	0.19	0.311	0.06	0.199	0.15	0.146	0.12	0.377	0.07	0.127	0.21
007	0.186	0.05	0.146	0.13	1.237	0.08	0.237	0.06	0.140	0.04	0.233	0.07	0.466	0.13	0.023	0.01
008	0.197	0.16	0.256	0.04	0.755	0.32	0.492	0.39	0.158	0.04	0.263	0.07	0.526	0.14	0.071	0.10
009	0.185	0.16	0.158	0.21	1.322	0.52	0.289	0.24	0.178	0.04	0.297	0.06	0.595	0.13	0:030	0.01
010	0.179	0.05	0.345	0.07	1.471	0.25	0.563	0.38	0.230	0.15	0.224	0.07	0.449	0.14	0.040	0.03
011	0.189	0.01	0.281	0.17	1.415	0.30	0.621	0.08	0.211	0.13	0.237	0.01	0.473	0.03	0.149	0.17
012	0.344	0.46	0.328	0.21	2.181	2.11	0.653	0.56	0.369	0.16	0.231	0.10	0.462	0.20	0.194	0.03
013	0.325	0.20	0.650	0.41	3.545	1.40	1.463	1.34	0.190	0.05	0.317	0.08	0.635	0.15	0.032	0.01
014	0.237	0.06	0.192	0.03	1.798	0.52	0.433	0.10	0.256	0.20	0.240	0.03	0.480	0.07	0.058	0.06
015	0.117	0.03	0.059	0.01	0.939	0.23	0.160	0.03	0.176	0.04	0.294	0.07	0.587	0.14	0.029	0.01
016	0.270	0.01	0.183	0.05	1.010	0.11	0.304	0.29	0.279	0.08	0.109	0.05	0.304	0.08	0.015	0.00
017	0.095	0.05	0.047	0.02	0.611	0.07	0.123	0.06	0.152	0.13	0.163	0.03	0.327	0.07	0.016	0.00
018	0.239	0.05	0.142	0.07	1.280	1.48	0.360	0.25	0.147	0.03	0.244	0.05	0.489	0.10	0.065	0.09
019	0.187	0.07	0.131	0.04	1.521	0.58	0.392	0.09	0.235	0.13	0.234	0.09	0.468	0.18	0.090	0.05
020	0.448	0.04	0.267	0.17	1.104	0.14	0.484	0.32	0.420	0.13	0.149	0.01	0.451	0.31	0.159	0.29
0[illegible]	0.224	0.08	0.056	0.02	1.128	0.14	0.277	0.19	0.168	0.06	0.281	0.10	0.561	0.20	0.049	0.03
0[illegible]	0.182	0.14	0.119	0.01	1.420	0.35	0.364	0.07	0.179	0.02	0.298	0.03	0.596	0.05	0.184	0.02
023	0.496	0.08	4.310	0.84	16.401	0.76	6.446	0.99	0.572	0.38	0.286	0.19	0.381	0.00	0.492	0.07
024	0.202	0.06	0.303	0.10	2.012	0.05	0.496	0.18	0.297	0.34	0.252	0.08	0.504	0.16	0.025	0.01
025	0.205	0.00	0.665	0.30	1.381	0.70	0.854	0.33	0.154	0.00	0.256	0.00	0.512	0.01	0.026	0.00
026	0.207	0.04	0.136	0.18	0.875	0.05	0.355	0.37	0.155	0.03	0.259	0.05	0.517	0.09	0.047	0.04
027	0.208	0.14	0.208	0.14	1.106	1.02	0.302	0.01	0.254	0.05	0.127	0.02	0.254	0.05	0.013	0.00
028	0.166	0.03	0.115	0.13	1.982	0.63	0.245	0.08	0.221	0.03	0.138	0.02	0.276	0.04	0.058	0.01
030	0.468	999.99	0.535	999.99	4.613	999.99	0.735	999.99	0.735	999.99	0.167	999.99	0.334	999.99	0.017	999.99
031	0.303	0.12	0.182	0.12	1.577	0.25	0.352	0.02	0.182	0.00	0.303	0.00	0.606	0.00	0.030	0.00
032	0.398	0.20	0.398	0.20	3.348	1.91	0.730	0.00	0.236	0.02	0.394	0.04	0.788	0.08	0.039	0.00
033	0.269	0.10	0.487	0.55	2.221	2.94	0.557	0.36	0.352	0.38	0.270	0.00	0.539	0.01	0.056	0.06
034	0.275	0.11	0.138	0.17	0.769	0.00	0.170	0.01	0.165	0.00	0.275	0.00	0.550	0.00	0.027	0.00
035	0.440	0.15	0.250	0.02	1.671	1.01	0.232	0.03	0.188	0.01	0.313	0.02	0.626	0.04	0.031	0.00
036	0.214	0.01	0.054	0.00	0.642	0.04	0.188	0.04	0.161	0.01	0.268	0.02	0.535	0.03	0.074	0.10
037	0.254	0.01	0.063	0.00	0.697	0.10	0.127	0.03	0.190	0.01	0.317	0.01	0.635	0.03	0.085	0.10
038	0.204	0.16	0.077	0.01	0.557	0.12	0.112	0.00	0.136	0.06	0.140	0.07	0.280	0.15	0.116	0.05
039	0.141	0.04	0.139	0.16	0.424	0.13	0.126	0.11	0.086	0.01	0.143	0.01	0.285	0.03	0.076	0.06
040	0.245	0.24	0.797	0.58	1.970	0.66	0.839	0.74	0.185	0.01	0.309	0.01	0.618	0.03	0.052	0.04
041	0.304	0.00	0.177	0.25	1.215	0.60	0.516	0.48	0.228	0.15	0.253	0.00	0.507	0.01	0.104	0.16
042	0.240	0.03	0.148	0.04	1.033	0.59	0.278	0.09	0.268	0.03	0.150	0.02	0.300	0.03	0.186	0.02
043	0.334	0.11	0.186	0.09	1.075	0.56	0.326	0.28	0.485	0.04	0.107	0.02	0.427	0.08	0.098	0.06
044	0.341	0.24	0.201	0.29	0.964	0.38	0.501	0.43	0.170	0.01	0.283	0.01	0.565	0.02	0.060	0.06
045	0.184	0.14	0.123	0.13	0.885	0.50	0.253	0.11	0.302	0.03	0.151	0.01	0.302	0.03	0.102	0.17
080	0.410	0.02	0.114	0.05	1.013	0.08	0.318	0.09	0.330	0.04	0.143	0.07	0.396	0.09	0.014	0.01
081	0.677	0.02	0.135	0.00	1.152	0.16	0.284	0.01	0.507	0.05	0.169	0.00	0.506	0.33	0.017	0.00
082	0.417	0.31	0.112	0.17	2.631	0.21	0.618	0.26	0.445	0.09	0.242	0.32	3.351	0.19	0.011	0.01
0[illegible]	0.738	0.13	0.345	0.21	1.710	0.29	0.532	0.29	0.503	0.04	0.194	0.02	0.574	0.34	0.321	0.00
Ar.Mean	0.283	0.11	0.305	0.14	1.732	0.50	0.543	0.22	0.252	0.08	0.226	0.05	0.529	0.10	0.083	0.05
Std.Dev.	0.134	0.11	0.613	0.17	2.305	0.60	0.903	0.26	0.134	0.09	0.067	0.06	0.432	0.09	0.087	0.06

A R I Z O N A P U B L I C S E R V I C E
MONTHLY REPORT for 3-90

AVERAGE DEPOSITION DATA (Pounds per Acre - 30 Days)
and Differences (d)

Location Number	PO4	d	CO3	d	HCO3	d	NH3	d	TSS	d	CU	d	Av d	SD(d)
001	0.014	0.01	2.156	0.89	5.752	6.31	0.120	0.03	24.150	9.94	0.043	0.02	1.28	2.99
002	0.009	0.00	2.289	1.01	2.289	1.01	0.092	0.04	22.500	9.25	0.046	0.02	0.90	2.43
003	0.026	0.04	1.666	0.57	8.664	2.95	0.145	0.18	43.204	13.43	0.033	0.01	1.29	3.58
004	0.008	0.00	1.971	0.04	3.336	2.69	0.079	0.00	22.166	16.25	0.039	0.00	1.39	4.34
005	0.008	0.00	1.902	0.03	7.249	5.45	0.076	0.00	19.037	4.89	0.038	0.00	0.79	1.86
006	0.021	0.03	1.457	1.20	4.697	0.48	0.230	0.29	28.114	9.60	0.038	0.01	0.90	2.52
007	0.033	0.02	2.328	0.67	9.316	9.07	0.093	0.03	29.509	14.27	0.047	0.01	1.76	4.32
008	0.033	0.04	2.631	0.69	4.713	4.85	0.105	0.03	46.231	68.67	0.053	0.01	5.40	18.26
009	0.012	0.00	2.974	0.65	5.282	5.26	0.119	0.03	14.515	23.73	0.059	0.01	2.22	6.34
010	0.020	0.02	2.244	0.69	3.574	1.98	0.204	0.20	38.540	23.29	0.045	0.01	1.95	6.16
011	0.034	0.03	2.366	0.13	2.366	0.13	0.095	0.01	41.979	8.11	0.047	0.00	0.67	2.14
012	0.024	0.02	2.308	1.02	5.540	2.45	0.380	0.53	42.078	16.50	0.046	0.02	1.74	4.32
013	0.041	0.06	3.175	0.76	12.597	11.79	0.127	0.03	95.493	47.98	0.063	0.02	4.59	12.86
014	0.010	0.00	2.400	0.33	5.760	0.78	0.096	0.01	29.825	5.95	0.048	0.01	0.58	1.56
015	0.012	0.00	2.935	0.72	2.935	0.72	0.117	0.03	17.467	2.00	0.059	0.01	0.29	0.55
016	0.004	0.00	1.093	0.47	2.623	1.13	0.129	0.15	29.143	26.74	0.022	0.01	2.08	7.10
017	0.007	0.00	1.634	0.33	1.634	0.33	0.065	0.01	10.911	1.66	0.033	0.01	0.20	0.44
018	0.019	0.02	2.444	0.49	3.983	2.59	0.098	0.02	20.281	10.44	0.049	0.01	1.12	2.78
019	0.028	0.03	2.341	0.91	3.662	1.74	0.169	0.11	45.693	15.87	0.047	0.02	1.42	4.19
020	0.030	0.02	1.495	0.05	5.642	3.98	0.179	0.01	32.700	19.15	0.030	0.00	1.76	[illegible]
021	0.044	0.07	2.806	1.01	2.806	1.01	0.112	0.04	16.521	14.63	0.056	0.02	1.26	[illegible]
022	0.012	0.00	2.981	0.27	2.981	0.27	0.119	0.01	16.285	9.81	0.060	0.01	0.79	2.60
023	0.084	0.03	1.907	0.00	54.926	4.58	0.076	0.00	858.214	419.57	0.038	0.00	30.53	111.98
024	0.054	0.06	2.522	0.80	9.021	4.01	0.101	0.03	41.834	19.20	0.050	0.02	1.79	5.12
025	0.097	0.17	2.560	0.03	6.145	0.06	0.204	0.20	62.374	38.29	0.051	0.00	2.86	10.20
026	0.021	0.00	2.586	0.47	10.153	9.01	0.103	0.02	15.983	13.14	0.052	0.01	1.68	4.06
027	0.021	0.01	1.270	0.25	4.652	2.62	0.051	0.01	26.361	19.71	0.025	0.00	1.72	5.23
028	0.193	0.37	1.382	0.21	7.187	1.11	0.055	0.01	19.736	12.95	0.028	0.00	1.12	3.42
030	0.007	999.99	1.671	999.99	16.714	999.99	0.067	999.99	86.914	999.99	0.033	999.99	999.99	999.99
031	0.043	0.06	3.032	0.01	5.159	4.27	0.121	0.00	24.259	0.10	0.061	0.00	0.35	1.13
032	0.071	0.02	3.938	0.40	20.475	2.08	0.158	0.02	69.621	19.66	0.079	0.01	1.76	5.20
033	0.103	0.10	2.696	0.04	10.272	7.70	0.108	0.00	50.834	41.71	0.054	0.00	3.85	11.10
034	0.016	0.01	2.748	0.01	4.667	3.83	0.110	0.00	14.286	2.13	0.055	0.00	0.45	1.12
035	0.019	0.01	3.129	0.21	11.747	7.98	0.125	0.01	21.238	1.10	0.214	0.30	0.78	2.10
036	0.033	0.04	2.677	0.16	4.605	4.01	0.107	0.01	19.272	1.12	0.054	0.00	0.40	1.08
037	0.032	0.04	3.175	0.14	3.175	0.14	0.127	0.01	10.159	0.46	0.063	0.00	0.08	0.12
038	0.006	0.00	1.401	0.74	2.123	0.70	0.056	0.03	11.675	6.35	0.028	0.01	0.60	1.67
039	0.006	0.00	1.427	0.13	2.470	2.21	0.057	0.01	14.542	12.40	0.029	0.00	1.09	3.31
040	0.031	0.04	3.091	0.13	7.417	0.31	0.124	0.01	71.079	56.34	0.062	0.00	4.22	15.00
041	0.010	0.00	2.534	0.03	4.300	3.50	0.202	0.20	24.269	24.08	0.051	0.00	2.10	6.39
042	0.015	0.01	1.500	0.17	1.500	0.17	0.180	0.02	26.433	17.40	0.044	0.03	1.33	4.63
043	0.036	0.00	1.068	0.20	6.481	1.76	0.571	0.02	15.129	11.59	0.021	0.00	1.06	3.07
044	0.017	0.01	2.825	0.12	2.825	0.12	0.113	0.00	34.138	24.00	0.057	0.00	1.84	6.38
045	0.009	0.01	1.511	0.13	7.856	0.67	0.060	0.01	29.012	11.40	0.030	0.00	0.95	3.01
080	0.116	0.16	1.430	0.65	4.757	1.08	0.057	0.03	23.263	9.98	0.029	0.01	0.88	2.64
081	0.054	0.09	1.693	0.04	4.063	0.10	0.068	0.00	22.286	8.91	0.034	0.00	0.70	[illegible]
082	0.005	0.00	1.125	0.62	6.377	1.03	0.045	0.02	37.397	23.98	0.023	0.01	1.94	[illegible]
083	0.008	0.00	1.939	0.15	4.654	0.36	0.155	0.01	40.680	0.82	0.039	0.00	0.19	[illegible]
Ar.Mean	0.032	0.04	2.217	0.40	6.898	2.77	0.128	0.05	49.111	24.86	0.048	0.01	2.10	6.75
Std.dev.	0.035	0.06	0.682	0.34	8.019	2.81	0.088	0.10	120.785	60.57	0.028	0.04	4.39	16.12

A R I Z O N A   P U B L I C   S E R V I C E
MONTHLY REPORT for 3-90

DEPOSITION DATA
Comments and Messages Only

Location Number	Sample A Comments	Sample B Comments	Processing Messages
001			
002			
003			
004			
005			
006			
007			
008			
009			
010			
011			
012			
013			
014			
015			
016			
017			
018		LIQUID LOSS DURING TRANSPORT	
019			
020			
[illegible]			
0[illegible]			
023	LIQUID DIRTY	LIQUID DIRTY	
024			
025			
026			
027			
028			
030		VOID/CONTAMINATION	MISSING SAMPLE B
031			
032			
033	LIQUID GREEN,BIRD DROPPINGS ON SCREEN		
034			
035			
036			
037			
038			
039			
040			
041			
042			
043	SCREEN MISSING	SCREEN MISSING	
044			
045			
080			
081			
08[illegible]			
0[illegible]			

A R I Z O N A P U B L I C S E R V I C E
MONTHLY REPORT for 4-90

AVERAGE DEPOSITION DATA (Pounds per Acre - 30 Days)
and Differences (d)

Location Number	Na	d	K	d	Ca	d	Mg	d	Cl	d	F	d	SO4	d	NO3	d
001	0.287	0.09	0.171	0.10	1.154	0.11	0.404	0.05	0.174	0.02	0.290	0.03	0.580	0.06	0.029	0.00
002	0.345	0.27	0.173	0.13	1.185	0.27	0.431	0.17	0.248	0.14	0.281	0.04	0.563	0.07	0.078	0.10
003	0.372	0.11	0.222	0.12	1.790	0.39	0.697	0.02	0.452	0.05	0.376	0.04	0.753	0.09	0.038	0.00
004	0.403	0.18	0.318	0.31	1.443	0.26	0.683	0.81	0.241	0.01	0.402	0.02	0.803	0.03	0.040	0.00
005	0.389	0.15	0.156	0.00	1.482	0.12	0.460	0.07	0.350	0.22	0.390	0.01	0.780	0.02	0.039	0.00
006	0.413	0.15	0.125	0.09	1.240	0.12	0.347	0.05	0.452	0.40	0.414	0.01	0.828	0.03	0.078	0.07
007	0.257	0.01	0.194	0.14	1.153	0.21	0.378	0.05	0.193	0.01	0.321	0.01	0.642	0.02	0.060	0.06
008	0.275	0.01	0.205	0.13	1.099	0.03	0.404	0.11	0.375	0.33	0.343	0.01	0.687	0.02	0.034	0.00
009	0.406	0.04	0.271	0.02	1.826	0.03	0.644	0.24	0.365	0.31	0.339	0.03	0.677	0.06	0.034	0.00
010	0.345	0.02	0.289	0.13	1.207	0.17	0.525	0.24	0.312	0.27	0.287	0.01	0.574	0.03	0.029	0.00
011	0.339	0.10	0.437	0.30	2.324	0.25	0.733	0.43	0.436	0.11	0.242	0.01	0.484	0.01	0.056	0.06
012	0.297	0.09	0.474	0.20	1.552	0.10	0.738	0.15	0.180	0.02	0.299	0.03	0.599	0.05	0.030	0.00
013	0.338	0.23	0.413	0.38	2.123	0.87	0.757	0.32	0.310	0.28	0.329	0.09	0.657	0.19	0.033	0.01
014	0.539	0.01	0.270	0.00	2.021	0.25	0.465	0.06	0.606	0.13	0.337	0.00	0.674	0.01	0.034	0.00
015	0.316	0.15	0.191	0.14	1.326	0.48	0.467	0.47	0.377	0.03	0.314	0.02	0.628	0.05	0.031	0.00
016	0.496	0.08	0.248	0.04	1.240	0.21	0.464	0.04	0.563	0.22	0.310	0.05	0.620	0.10	0.031	0.01
017	0.332	0.01	0.166	0.00	0.995	0.02	0.299	0.11	0.375	0.26	0.415	0.01	0.829	0.02	0.041	0.00
018	0.271	0.03	0.200	0.11	0.806	0.19	0.273	0.15	0.300	0.17	0.339	0.04	0.677	0.07	0.034	0.00
019	0.415	0.34	1.804	0.21	5.959	0.99	3.048	1.24	0.597	0.02	0.335	0.06	0.670	0.13	0.034	0.01
020	0.357	0.14	0.143	0.00	0.928	0.14	0.314	0.06	0.500	0.14	0.357	0.00	0.714	0.00	0.036	0.00
[illegible]	0.304	0.13	0.183	0.13	1.091	0.03	0.377	0.28	0.331	0.29	0.303	0.01	0.606	0.02	0.030	0.00
[illegible]	0.195	0.13	0.098	0.07	0.846	0.14	0.215	0.02	0.195	0.00	0.325	0.00	0.650	0.01	0.033	0.00
023	1.276	0.40	6.762	0.89	25.382	1.61	13.838	1.49	0.713	0.11	0.397	0.02	0.795	0.05	0.321	0.24
024	0.246	0.01	0.123	0.00	1.228	0.05	0.362	0.05	0.341	0.32	0.307	0.01	0.614	0.02	0.031	0.00
025	0.276	0.03	0.406	0.23	1.307	0.02	0.628	0.17	0.207	0.02	0.345	0.04	0.690	0.08	0.035	0.00
026	0.300	0.09	0.121	0.01	1.205	0.11	0.282	0.05	0.325	0.27	0.303	0.03	0.606	0.07	0.085	0.11
027	0.298	0.02	0.149	0.01	0.817	0.10	0.281	0.13	0.223	0.01	0.372	0.02	0.744	0.04	0.055	0.03
028	1.205	1.81	0.145	0.01	1.378	0.22	0.275	0.01	0.217	0.01	0.362	0.02	0.724	0.04	0.036	0.00
030	1.211	0.35	1.442	0.81	7.267	2.08	2.826	1.50	1.664	0.36	0.330	0.08	0.659	0.16	0.076	0.08
031	0.288	0.07	0.171	0.09	0.988	0.03	0.288	0.07	0.269	0.21	0.292	0.04	0.584	0.08	0.029	0.00
032	0.402	0.18	0.405	0.50	4.166	0.50	1.039	0.05	0.358	0.22	0.400	0.02	0.800	0.04	0.040	0.00
033	0.259	0.03	0.095	0.05	0.899	0.17	0.236	0.13	0.296	0.22	0.323	0.03	0.647	0.07	0.032	0.00
034	0.194	0.14	0.097	0.07	0.769	0.32	0.235	0.01	0.191	0.02	0.318	0.03	0.636	0.05	0.032	0.00
035	0.307	0.01	0.267	0.38	1.304	0.13	0.490	0.17	0.230	0.00	0.384	0.01	0.768	0.02	0.038	0.00
036	0.267	0.00	0.100	0.07	0.734	0.12	0.174	0.02	0.369	0.34	0.334	0.00	0.668	0.01	0.033	0.00
037	0.290	0.01	0.109	0.08	0.727	0.31	0.224	0.04	0.217	0.01	0.362	0.01	0.724	0.02	0.036	0.00
038	0.149	0.01	0.113	0.08	0.597	0.03	0.165	0.07	0.224	0.01	0.373	0.02	0.746	0.04	0.037	0.00
039	0.303	0.02	0.115	0.08	0.910	0.05	0.318	0.01	0.228	0.01	0.379	0.02	0.759	0.04	0.038	0.00
040	0.210	0.16	0.415	0.03	1.118	0.64	0.563	0.17	0.207	0.02	0.346	0.03	0.691	0.06	0.035	0.00
041	0.359	0.01	0.180	0.12	1.139	0.15	0.390	0.09	0.271	0.19	0.299	0.01	0.599	0.02	0.131	0.04
042	0.231	0.05	0.179	0.15	0.577	0.13	0.214	0.16	0.333	0.36	0.288	0.06	0.577	0.13	0.051	0.05
043	0.773	0.05	0.746	0.37	1.359	0.48	0.437	0.17	1.039	0.59	0.400	0.13	0.799	0.27	0.040	0.01
044	0.518	0.17	0.295	0.01	1.107	0.20	0.517	0.14	0.221	0.01	0.369	0.02	0.737	0.04	0.037	0.00
045	0.569	0.13	0.242	0.15	1.375	0.73	0.323	0.21	0.574	0.20	0.408	0.03	0.816	0.05	0.041	0.00
080	0.553	0.10	0.138	0.03	1.773	1.29	0.344	0.19	0.364	0.27	0.345	0.06	0.691	0.13	0.035	0.01
081	0.599	0.01	0.135	0.03	1.514	0.35	0.291	0.05	0.539	0.11	0.337	0.07	0.674	0.14	0.055	0.04
082	0.542	0.18	0.154	0.01	1.162	0.51	0.208	0.04	0.231	0.01	0.386	0.02	0.772	0.03	0.039	0.00
0[illegible]	0.485	0.01	0.162	0.00	1.861	0.54	0.502	0.14	0.242	0.01	0.404	0.01	0.808	0.02	0.040	0.00
Ar.Mean	0.412	0.14	0.417	0.15	2.030	0.34	0.804	0.22	0.375	0.15	0.344	0.03	0.688	0.06	0.049	0.02
Std.Dev.	0.246	0.27	0.986	0.19	3.652	0.42	1.996	0.34	0.252	0.14	0.041	0.03	0.083	0.05	0.044	0.04

ARIZONA PUBLIC SERVICE
MONTHLY REPORT for 4-90

AVERAGE DEPOSITION DATA (Pounds per Acre - 30 Days)
and Differences (d)

Location Number	PO4	d	CO3	d	HCO3	d	NH3	d	TSS	d	CU	d	Av d	SD(d)
001	0.018	0.01	2.900	0.29	2.900	0.29	0.116	0.01	18.797	11.16	0.058	0.01	0.87	2.96
002	0.022	0.02	2.813	0.38	6.750	0.90	0.113	0.01	21.600	9.60	0.056	0.01	0.86	2.52
003	0.023	0.02	3.764	0.43	6.551	6.01	0.151	0.02	42.162	4.85	0.075	0.01	0.87	1.95
004	0.016	0.00	4.017	0.16	6.773	5.35	0.161	0.01	47.694	49.51	0.080	0.00	4.05	13.16
005	0.016	0.00	3.901	0.10	6.668	5.63	0.156	0.00	32.792	3.97	0.078	0.00	0.74	1.75
006	0.017	0.00	4.139	0.14	4.139	0.14	0.166	0.01	26.435	5.70	0.083	0.00	0.49	1.50
007	0.013	0.00	3.210	0.12	5.414	4.28	0.128	0.00	17.373	4.53	0.064	0.00	0.67	1.58
008	0.014	0.00	3.434	0.09	3.434	0.09	0.137	0.00	21.900	10.39	0.069	0.00	0.80	2.76
009	0.026	0.02	3.387	0.30	8.128	0.73	0.135	0.01	18.844	3.71	0.068	0.01	0.39	0.98
010	0.017	0.01	2.871	0.14	6.891	0.34	0.115	0.01	35.686	8.63	0.057	0.00	0.72	2.28
011	0.049	0.08	2.420	0.06	8.677	5.60	0.097	0.00	50.616	47.68	0.048	0.00	3.91	12.68
012	0.059	0.04	2.994	0.27	2.994	0.27	0.120	0.01	58.308	11.48	0.060	0.01	0.91	3.05
013	0.028	0.03	3.287	0.95	3.287	0.95	0.131	0.04	46.589	21.18	0.066	0.02	1.82	5.58
014	0.013	0.00	3.369	0.04	5.715	4.66	0.135	0.00	21.534	10.56	0.067	0.00	1.12	2.98
015	0.019	0.01	3.141	0.23	3.141	0.23	0.126	0.01	25.500	21.98	0.063	0.00	1.70	5.84
016	0.012	0.00	3.101	0.52	5.453	5.22	0.124	0.02	28.633	7.26	0.062	0.01	0.98	2.27
017	0.017	0.00	4.147	0.10	7.085	5.98	0.166	0.00	16.587	0.40	0.083	0.00	0.49	1.58
018	0.014	0.00	3.387	0.35	3.387	0.35	0.135	0.01	18.825	3.45	0.068	0.01	0.35	0.90
019	0.026	0.02	3.352	0.63	24.131	4.56	0.134	0.03	262.055	62.77	0.067	0.01	5.07	16.65
020	0.014	0.00	3.570	0.01	6.074	5.02	0.143	0.00	18.577	14.35	0.071	0.00	1.42	[illegible]
021	0.024	0.02	3.029	0.08	3.029	0.08	0.121	0.00	36.450	15.52	0.061	0.00	1.19	[illegible]
022	0.019	0.01	3.252	0.04	3.252	0.04	0.130	0.00	16.917	2.78	0.065	0.00	0.23	0.74
023	0.120	0.09	3.974	0.25	76.817	12.73	0.159	0.01	939.231	153.23	0.079	0.00	12.22	40.72
024	0.012	0.00	3.070	0.12	5.179	4.10	0.123	0.00	30.680	1.28	0.061	0.00	0.43	1.11
025	0.020	0.01	3.451	0.41	8.283	0.98	0.138	0.02	32.967	1.58	0.069	0.01	0.26	0.46
026	0.012	0.00	3.028	0.33	3.028	0.33	0.121	0.01	17.841	10.14	0.061	0.01	0.83	2.68
027	0.015	0.00	3.721	0.20	3.721	0.20	0.149	0.01	23.735	4.66	0.074	0.00	0.39	1.23
028	0.014	0.00	3.620	0.20	3.620	0.20	0.145	0.01	17.296	4.82	0.072	0.00	0.53	1.32
030	0.061	0.06	3.296	0.82	27.190	1.00	0.247	0.20	136.142	189.25	0.066	0.02	14.06	50.43
031	0.012	0.00	2.918	0.42	2.918	0.42	0.117	0.02	24.715	6.88	0.058	0.01	0.60	1.81
032	0.032	0.03	4.002	0.18	14.513	10.24	0.160	0.01	89.784	16.74	0.080	0.00	2.05	5.01
033	0.013	0.00	3.234	0.33	3.234	0.33	0.129	0.01	24.778	10.26	0.065	0.01	0.83	2.72
034	0.013	0.00	3.182	0.27	3.182	0.27	0.127	0.01	8.156	10.22	0.064	0.01	0.82	2.71
035	0.023	0.01	3.838	0.08	6.496	5.23	0.154	0.00	35.161	26.88	0.077	0.00	2.35	7.19
036	0.040	0.05	3.340	0.05	3.340	0.05	0.134	0.00	13.359	0.19	0.067	0.00	0.06	0.10
037	0.037	0.04	3.621	0.12	3.621	0.12	0.145	0.00	9.141	11.16	0.072	0.00	0.85	2.97
038	0.015	0.00	3.728	0.22	3.728	0.22	0.149	0.01	13.552	9.73	0.075	0.00	0.75	2.59
039	0.015	0.00	3.793	0.20	3.793	0.20	0.152	0.01	14.308	21.23	0.076	0.00	1.56	5.66
040	0.027	0.03	3.457	0.28	5.779	4.36	0.138	0.01	58.303	15.79	0.069	0.01	1.54	4.26
041	0.012	0.00	2.994	0.08	2.994	0.08	0.120	0.00	24.530	2.94	0.060	0.00	0.27	0.77
042	0.017	0.01	2.885	0.63	2.885	0.63	0.115	0.03	7.763	9.12	0.058	0.01	0.82	2.40
043	0.141	0.02	3.995	1.33	6.327	3.34	0.360	0.35	32.763	1.56	0.080	0.03	0.62	0.92
044	0.015	0.00	3.686	0.18	3.686	0.18	0.147	0.01	32.433	1.55	0.074	0.00	0.18	0.40
045	0.016	0.00	4.082	0.26	6.848	5.27	0.163	0.01	27.704	1.50	0.082	0.01	0.61	1.40
080	0.262	0.32	3.454	0.65	3.454	0.65	0.138	0.03	22.367	9.68	0.069	0.01	0.96	2.54
081	0.013	0.00	3.368	0.71	5.973	5.92	0.135	0.03	21.554	4.52	0.067	0.01	0.86	[illegible]
082	0.015	0.00	3.858	0.16	3.858	0.16	0.154	0.01	23.181	4.04	0.077	0.00	0.37	[illegible]
083	0.016	0.00	4.038	0.12	6.825	5.46	0.162	0.00	43.731	17.40	0.081	0.00	1.69	[illegible]
Ar.Mean	0.031	0.02	3.440	0.29	7.399	2.49	0.144	0.02	54.355	18.29	0.069	0.01	1.59	5.02
Std.dev.	0.042	0.05	0.414	0.26	11.266	2.99	0.039	0.06	136.372	34.82	0.008	0.01	2.64	9.21

A R I Z O N A   P U B L I C   S E R V I C E

MONTHLY REPORT for 4-90

DEPOSITION DATA

Comments and Messages Only

Location Number	Sample A Comments	Sample B Comments	Processing Messages
001			
002			
003			
004			
005			
006			
007			
008			
009			
010			
011			
012			
013			
014			
015			
016			
017			
018			
019		LIQUID LOSS IN TRANSPORT	
020			
[illegible]			
0[illegible]			
023	LIQUID DIRTY	LIQUID DIRTY	
024			
025			
026			
027			
028			
030			
031			
032			
033			
034			
035			
036			
037			
038			
039			
040			
041			
042			
043			
044			
045			
080			
081			
08[illegible]			
0[illegible]			

A R I Z O N A   P U B L I C   S E R V I C E
MONTHLY REPORT for 5-90

AVERAGE DEPOSITION DATA (Pounds per Acre - 30 Days)
and Differences (d)

Location Number	Na	d	K	d	Ca	d	Mg	d	Cl	d	F	d	SO4	d	NO3	d
001	0.409	0.28	0.354	0.17	1.150	0.34	0.345	0.01	0.261	0.19	0.249	0.05	0.498	0.11	0.025	0.01
002	0.234	0.01	0.194	0.07	1.186	0.14	0.339	0.15	0.371	0.06	0.242	0.09	0.485	0.17	0.024	0.01
003	0.471	0.31	0.345	0.06	1.486	0.05	0.386	0.08	0.397	0.04	0.288	0.05	0.575	0.11	0.029	0.01
004	0.508	0.13	0.291	0.01	1.960	0.09	0.456	0.23	0.436	0.01	0.363	0.01	0.726	0.02	0.036	0.00
005	0.498	0.18	0.425	0.03	2.052	0.00	0.453	0.03	0.493	0.11	0.354	0.02	0.708	0.05	0.035	0.00
006	0.774	0.33	0.309	0.01	2.084	0.09	0.426	0.12	0.539	0.14	0.386	0.01	0.772	0.02	0.039	0.00
007	0.385	0.33	0.275	0.11	1.318	0.21	0.187	0.02	0.165	0.00	0.275	0.00	0.549	0.00	0.027	0.00
008	0.541	0.09	0.316	0.16	1.131	0.08	0.176	0.03	0.374	0.05	0.270	0.04	0.541	0.09	0.027	0.00
009	0.391	0.22	0.266	0.03	1.791	0.08	0.281	0.09	0.199	0.02	0.332	0.04	0.665	0.08	0.033	0.00
010	0.552	0.32	0.158	0.16	1.339	0.18	0.207	0.09	0.245	0.13	0.246	0.10	0.493	0.20	0.025	0.01
011	0.183	0.01	0.641	0.04	2.699	0.06	0.960	0.04	0.366	0.02	0.229	0.01	0.458	0.03	0.070	0.09
012	0.199	0.06	0.324	0.19	1.542	0.10	0.347	0.33	0.340	0.01	0.248	0.08	0.497	0.16	0.052	0.05
013	0.326	0.11	0.263	0.02	1.313	0.09	0.340	0.03	0.197	0.01	0.328	0.02	0.656	0.05	0.033	0.00
014	0.391	0.10	0.280	0.12	1.452	0.03	0.279	0.08	0.503	0.12	0.279	0.01	0.559	0.01	0.028	0.00
015	0.451	0.14	0.386	0.01	1.414	0.03	0.290	0.12	0.193	0.00	0.321	0.01	0.643	0.01	0.032	0.00
016	0.277	0.03	0.204	0.11	1.166	0.28	0.258	0.08	0.438	0.01	0.200	0.03	0.401	0.07	0.020	0.00
017	0.136	0.27	0.146	0.07	0.897	0.02	0.204	0.01	0.264	0.20	0.252	0.05	0.504	0.10	0.025	0.01
018	0.194	0.01	0.097	0.00	0.968	0.04	0.150	0.00	0.145	0.01	0.242	0.01	0.484	0.02	0.058	0.00
019	0.000	0.00	0.334	0.21	2.173	0.23	0.396	0.27	0.262	0.18	0.253	0.07	0.506	0.13	0.025	0.01
020	0.413	0.11	0.530	0.34	1.182	0.20	0.388	0.39	0.532	0.10	0.296	0.01	0.592	0.02	0.030	0.00
0[illegible]	0.260	0.03	0.153	0.06	1.470	0.01	0.273	0.07	0.275	0.18	0.268	0.08	0.536	0.16	0.027	0.01
[illegible]	0.175	0.09	0.183	0.14	1.547	0.21	0.220	0.02	0.262	0.14	0.298	0.04	0.595	0.08	0.030	0.00
023	0.355	0.23	2.666	0.10	18.955	2.21	5.034	0.79	0.415	0.12	0.296	0.00	0.593	0.01	0.030	0.00
024	0.214	0.04	0.156	0.08	1.227	0.10	0.266	0.00	0.283	0.22	0.268	0.04	0.535	0.09	0.027	0.00
025	0.219	0.03	0.270	0.07	0.759	0.10	0.262	0.00	0.164	0.02	0.274	0.04	0.548	0.08	0.027	0.00
026	0.208	0.04	0.169	0.03	1.139	0.14	0.215	0.11	0.292	0.03	0.212	0.04	0.423	0.08	0.038	0.03
027	0.261	0.04	0.261	0.04	1.688	0.02	0.363	0.03	0.392	0.06	0.326	0.05	0.653	0.09	0.033	0.00
028	0.200	0.01	0.149	0.09	2.845	0.39	0.215	0.04	0.223	0.14	0.250	0.01	0.500	0.02	0.025	0.00
030	0.503	0.03	0.699	0.37	4.239	0.64	1.416	1.28	0.773	0.17	0.230	0.03	0.460	0.06	0.023	0.00
031	0.293	0.12	0.175	0.11	1.638	0.03	0.286	0.05	0.468	0.01	0.293	0.01	0.585	0.01	0.029	0.00
032	0.090	0.18	0.427	0.14	2.584	0.20	0.454	0.08	0.258	0.02	0.431	0.03	0.861	0.07	0.043	0.00
033	0.224	0.02	0.282	0.13	1.846	0.02	0.343	0.13	0.390	0.08	0.280	0.02	0.560	0.04	0.028	0.00
034	0.000	0.00	0.160	0.11	0.963	0.21	0.166	0.01	0.160	0.00	0.267	0.00	0.535	0.00	0.027	0.00
035	0.000	0.00	0.256	0.04	2.732	2.96	0.180	0.06	0.192	0.03	0.320	0.06	0.640	0.11	0.032	0.01
036	0.061	0.12	0.235	0.01	1.236	0.19	0.286	0.28	0.176	0.01	0.294	0.02	0.587	0.04	0.029	0.00
037	0.248	0.01	0.368	0.48	1.238	0.21	0.517	0.50	0.186	0.01	0.310	0.01	0.620	0.02	0.031	0.00
038	0.153	0.12	0.147	0.08	1.047	0.03	0.168	0.04	0.150	0.02	0.250	0.03	0.500	0.06	0.025	0.00
039	0.167	0.01	0.167	0.01	0.873	0.20	0.203	0.08	0.186	0.11	0.209	0.01	0.418	0.03	0.063	0.08
040	0.130	0.26	0.205	0.15	0.875	0.07	0.188	0.04	0.202	0.01	0.337	0.02	0.675	0.05	0.034	0.00
041	0.313	0.08	0.314	0.10	1.208	0.05	0.254	0.11	0.200	0.13	0.224	0.01	0.448	0.01	0.055	0.07
042	0.348	0.06	0.193	0.07	0.928	0.12	0.277	0.19	0.387	0.02	0.194	0.01	0.387	0.02	0.019	0.00
043	0.791	0.07	0.362	0.22	1.700	0.38	0.324	0.06	0.972	0.18	0.305	0.02	0.610	0.04	0.031	0.00
044	0.172	0.34	0.365	0.19	0.991	0.08	0.292	0.31	0.274	0.14	0.313	0.05	0.626	0.10	0.031	0.01
045	0.166	0.33	0.335	0.23	1.616	0.10	0.536	0.36	0.558	0.01	0.279	0.00	0.558	0.01	0.042	0.03
080	0.607	0.09	0.201	0.12	1.627	0.13	0.291	0.01	0.613	0.19	0.339	0.03	0.678	0.06	0.034	0.00
081	0.618	0.06	0.353	0.28	1.102	1.02	0.626	0.71	0.618	0.06	0.257	0.02	0.515	0.05	0.026	0.00
082	0.323	0.17	0.323	0.17	1.331	0.07	0.180	0.08	0.382	0.06	0.318	0.05	0.636	0.09	0.032	0.00
0[illegible]	0.414	0.26	0.279	0.02	1.666	0.46	0.377	0.08	0.558	0.03	0.349	0.02	0.697	0.04	0.090	0.01
Ar.Mean	0.309	0.12	0.333	0.12	1.904	0.26	0.439	0.16	0.349	0.07	0.284	0.03	0.569	0.06	0.034	0.01
Std.Dev.	0.186	0.11	0.365	0.10	2.594	0.53	0.710	0.24	0.175	0.07	0.049	0.02	0.099	0.05	0.014	0.02

A R I Z O N A   P U B L I C   S E R V I C E
MONTHLY REPORT for 5-90

AVERAGE DEPOSITION DATA (Pounds per Acre - 30 Days)
and Differences (d)

Location Number	PO4	d	CO3	d	HCO3	d	NH3	d	TSS	d	CU	d	Av d	SD(d)
001	0.010	0.00	2.489	0.53	2.489	0.53	0.100	0.02	21.016	6.44	0.050	0.01	0.62	1.69
002	0.014	0.00	2.425	0.87	2.425	0.87	0.097	0.03	19.153	6.30	0.048	0.02	0.63	1.66
003	0.012	0.00	2.877	0.53	2.877	0.53	0.115	0.02	18.414	3.39	0.058	0.01	0.37	0.89
004	0.015	0.00	3.632	0.10	3.632	0.10	0.145	0.00	13.017	8.37	0.109	0.08	0.65	2.22
005	0.014	0.00	3.542	0.25	3.542	0.25	0.142	0.01	11.975	17.12	0.071	0.00	1.29	4.56
006	0.015	0.00	3.861	0.11	3.861	0.11	0.154	0.00	11.303	14.99	0.115	0.07	1.14	3.99
007	0.011	0.00	2.746	0.02	2.746	0.02	0.110	0.00	5.780	6.09	0.055	0.00	0.49	1.62
008	0.011	0.00	2.703	0.44	2.703	0.44	0.158	0.08	2.703	0.44	0.054	0.01	0.14	0.17
009	0.013	0.00	3.323	0.39	3.323	0.39	0.133	0.02	5.514	3.99	0.066	0.01	0.38	1.05
010	0.010	0.00	2.463	1.02	2.463	1.02	0.099	0.04	5.735	7.56	0.049	0.02	0.78	1.98
011	0.036	0.03	2.289	0.13	5.493	0.31	0.092	0.01	59.741	19.84	0.046	0.00	1.47	5.29
012	0.018	0.01	2.483	0.78	2.483	0.78	0.099	0.03	4.492	4.79	0.050	0.02	0.53	1.26
013	0.013	0.00	3.282	0.23	3.282	0.23	0.131	0.01	10.569	14.35	0.066	0.00	1.08	3.82
014	0.011	0.00	2.793	0.05	2.793	0.05	0.112	0.00	6.944	8.25	0.056	0.00	0.63	2.19
015	0.013	0.00	3.213	0.06	3.213	0.06	0.129	0.00	15.872	25.38	0.064	0.00	1.85	6.77
016	0.008	0.00	2.004	0.34	3.290	2.23	0.080	0.01	9.890	8.03	0.040	0.01	0.80	2.16
017	0.010	0.00	2.519	0.51	2.519	0.51	0.101	0.02	4.461	4.40	0.050	0.01	0.44	1.15
018	0.010	0.00	2.419	0.10	2.419	0.10	0.097	0.00	6.924	8.91	0.048	0.00	0.66	2.38
019	0.015	0.01	2.528	0.65	6.068	1.57	0.101	0.03	15.039	1.90	0.051	0.01	0.38	0.60
020	0.053	0.06	2.958	0.08	5.000	4.00	0.823	0.69	2.958	0.08	0.059	0.00	0.43	1.04
021	0.020	0.02	2.681	0.79	4.283	2.41	0.199	0.15	2.681	0.79	0.054	0.02	0.34	[illegible]
022	0.012	0.00	2.975	0.40	2.975	0.40	0.119	0.02	2.975	0.40	0.060	0.01	0.14	[illegible]
023	0.035	0.05	2.962	0.02	50.955	0.43	0.119	0.00	331.600	92.00	0.059	0.00	6.85	24.51
024	0.011	0.00	2.677	0.44	2.677	0.44	0.107	0.02	2.677	0.44	0.083	0.07	0.14	0.17
025	0.011	0.00	2.741	0.41	2.741	0.41	0.169	0.13	4.516	3.13	0.055	0.01	0.32	0.82
026	0.008	0.00	2.117	0.41	2.117	0.41	0.085	0.02	2.117	0.41	0.042	0.01	0.13	0.16
027	0.013	0.00	3.264	0.47	3.264	0.47	0.131	0.02	3.264	0.47	0.065	0.01	0.13	0.19
028	0.010	0.00	2.500	0.10	12.000	0.48	0.100	0.00	2.500	0.10	0.050	0.00	0.10	0.15
030	0.022	0.02	2.300	0.30	13.620	3.72	0.092	0.01	81.160	72.88	0.046	0.01	5.68	19.37
031	0.012	0.00	2.925	0.05	2.925	0.05	0.117	0.00	2.925	0.05	0.059	0.00	0.04	0.04
032	0.017	0.00	4.306	0.34	4.306	0.34	0.172	0.01	12.168	15.39	0.086	0.01	1.20	4.08
033	0.011	0.00	2.800	0.20	4.690	3.58	0.112	0.01	4.830	4.26	0.056	0.00	0.61	1.41
034	0.011	0.00	2.675	0.00	2.675	0.00	0.107	0.00	2.675	0.00	0.053	0.00	0.02	0.06
035	0.013	0.00	3.200	0.55	8.758	10.56	0.128	0.02	8.850	1.02	0.093	0.05	1.11	2.84
036	0.012	0.00	2.938	0.18	2.938	0.18	0.118	0.01	2.938	0.18	0.059	0.00	0.09	0.10
037	0.013	999.99	3.150	999.99	3.150	999.99	0.124	0.00	3.150	999.99	0.062	0.00	0.12	0.20
038	0.010	0.00	2.500	0.30	2.500	0.30	0.100	0.01	6.965	8.63	0.050	0.01	0.69	2.29
039	0.008	0.00	2.088	0.13	2.088	0.13	0.084	0.01	7.490	1.22	0.042	0.00	0.14	0.32
040	0.013	0.00	3.375	0.23	3.375	0.23	0.135	0.01	12.010	7.26	0.067	0.00	0.60	1.92
041	0.009	0.00	2.238	0.07	2.238	0.07	0.090	0.00	10.655	10.39	0.045	0.00	0.79	2.76
042	0.008	0.00	1.937	0.08	1.937	0.08	0.078	0.00	9.300	0.36	0.039	0.00	0.07	0.10
043	0.012	0.00	3.050	0.20	5.115	3.93	0.181	0.11	9.760	0.64	0.061	0.00	0.42	1.03
044	0.030	0.03	3.129	0.52	3.129	0.52	0.355	0.44	17.845	19.43	0.063	0.01	1.58	5.14
045	0.011	0.00	2.787	0.03	2.787	0.03	0.112	0.00	5.840	6.08	0.056	0.00	0.51	1.61
080	0.014	0.00	3.389	0.28	3.389	0.28	0.136	0.01	8.681	10.86	0.068	0.01	0.86	2.88
081	0.015	0.01	2.573	0.23	4.456	4.00	0.299	0.38	37.707	70.03	0.051	0.00	5.49	18.61
082	0.030	0.03	3.181	0.47	3.181	0.47	0.372	0.20	7.597	8.36	0.064	0.01	0.73	[illegible]
083	0.014	0.00	3.486	0.19	3.486	0.19	0.139	0.01	3.486	0.19	0.070	0.00	0.11	[illegible]
Ar.Mean	0.015	0.01	2.844	0.31	4.758	1.03	0.148	0.06	17.914	10.76	0.060	0.01	0.91	2.92
Std.dev.	0.009	0.01	0.495	0.24	7.174	1.84	0.117	0.13	48.389	19.02	0.016	0.02	1.41	4.97

ARIZONA PUBLIC SERVICE
MONTHLY REPORT for 5-90

DEPOSITION DATA
Comments and Messages Only

Location Number	Sample A Comments	Sample B Comments	Processing Messages
001			
002			
003			
004			
005			
006			
007			
008			
009			
010			
011			
012			
013			
014			
015			
016			
017			
018			
019			
020			
[illegible]			
[illegible]			
023			
024			
025			
026			
027			
028			
030			
031			
032			
033			
034			
035			
036			
037	SAMPLE LEAKED IN TRANSPORT		
038			
039			
040			
041			
042			
043			
044			
045			
080			
081			
08[illegible]			
0[illegible]			

ARIZONA PUBLIC SERVICE
MONTHLY REPORT for 6-90

AVERAGE DEPOSITION DATA (Pounds per Acre - 30 Days)
and Differences (d)

Location Number	Na	d	K	d	Ca	d	Mg	d	Cl	d	F	d	SO4	d	NO3	d
001	0.151	0.02	0.087	0.01	0.883	0.07	0.164	0.06	0.241	0.08	0.109	0.02	0.218	0.03	0.056	0.06
002	0.330	0.32	0.370	0.57	0.580	0.15	0.178	0.05	0.497	0.15	0.208	0.01	0.415	0.01	0.035	0.03
003	0.263	0.15	0.328	0.15	1.798	0.45	0.784	0.19	0.422	0.03	0.163	0.01	0.326	0.02	0.024	0.01
004	0.093	0.05	0.185	0.10	0.849	0.04	0.396	0.39	0.256	0.16	0.157	0.02	0.315	0.04	0.037	0.01
005	0.180	0.09	0.218	0.17	1.733	1.06	0.537	0.28	0.285	0.03	0.178	0.02	0.356	0.04	0.018	0.00
006	0.152	0.01	0.149	0.14	0.792	0.16	0.291	0.22	0.464	0.49	0.190	0.01	0.379	0.03	0.019	0.00
007	0.139	0.12	0.268	0.05	1.154	0.05	0.569	0.04	0.235	0.18	0.224	0.04	0.447	0.09	0.022	0.00
008	0.367	0.53	0.103	0.00	0.672	0.13	0.119	0.04	0.234	0.16	0.258	0.01	0.516	0.02	0.026	0.00
009	0.123	0.00	0.307	0.12	1.476	0.02	0.424	0.10	0.340	0.31	0.308	0.01	0.615	0.01	0.031	0.00
010	0.133	0.05	0.149	0.09	0.705	0.13	0.250	0.09	0.256	0.19	0.174	0.19	0.347	0.37	0.017	0.02
011	0.209	0.05	0.232	0.10	1.604	0.65	0.453	0.50	0.210	0.14	0.173	0.11	0.346	0.22	0.017	0.01
012	0.089	999.99	0.178	999.99	0.712	999.99	0.240	999.99	0.134	999.99	0.223	999.99	0.445	999.99	0.022	999.99
013	0.462	0.67	0.709	0.98	1.629	2.06	0.295	0.39	0.756	0.88	0.206	0.25	0.411	0.51	0.021	0.03
014	0.209	0.13	0.141	0.01	1.201	0.21	0.180	0.00	0.357	0.30	0.262	0.16	0.524	0.32	0.026	0.02
015	0.076	0.03	0.153	0.05	1.150	0.01	0.280	0.15	0.162	0.06	0.270	0.10	0.540	0.19	0.027	0.01
016	0.207	0.08	0.310	0.12	1.020	0.19	0.577	0.08	0.518	0.04	0.096	0.01	0.192	0.03	0.010	0.00
017	0.117	0.07	0.238	0.02	0.756	0.15	0.407	0.20	0.119	0.01	0.198	0.02	0.397	0.04	0.020	0.00
018	0.092	0.07	0.210	0.17	0.462	0.33	0.395	0.27	0.212	0.05	0.152	0.01	0.305	0.02	0.051	0.07
019	0.238	0.03	1.187	0.24	4.141	4.80	2.635	0.67	0.291	0.02	0.133	0.01	0.266	0.03	0.013	0.00
020	0.306	0.18	0.392	0.08	0.619	0.10	0.387	0.01	0.477	0.01	0.104	0.01	0.306	0.18	0.010	0.00
[illegible]	0.226	0.14	0.226	0.14	0.747	0.08	0.199	0.19	0.231	0.17	0.221	0.05	0.442	0.10	0.022	0.00
[illegible]	0.080	0.06	0.107	0.00	0.692	0.08	0.129	0.15	0.160	0.01	0.266	0.01	0.533	0.02	0.055	0.06
023	999.999	999.99	999.999	999.99	999.999	999.99	999.999	999.99	999.999	999.99	999.999	999.99	999.999	999.99	999.999	999.99
024	1.220	2.26	0.285	0.21	1.037	0.47	0.382	0.35	0.140	0.01	0.234	0.02	0.467	0.04	0.023	0.00
025	0.250	0.18	0.358	0.24	0.490	0.30	0.502	0.14	0.332	0.42	0.185	0.03	0.370	0.06	0.019	0.00
026	0.145	0.09	0.246	0.11	0.779	0.15	0.395	0.09	0.147	0.01	0.244	0.01	0.489	0.03	0.024	0.00
027	0.115	0.01	0.115	0.01	0.602	0.02	0.234	0.01	0.182	0.03	0.119	0.04	0.238	0.08	0.050	0.08
028	0.145	0.00	0.182	0.08	1.746	0.63	0.455	0.25	0.163	0.10	0.181	0.00	0.363	0.01	0.099	0.11
030	0.579	0.01	0.675	0.18	4.728	0.51	1.656	0.33	0.934	0.34	0.201	0.08	0.402	0.15	0.224	0.36
031	0.284	0.13	0.316	0.41	1.893	0.91	0.369	0.43	0.439	0.01	0.247	0.06	0.494	0.12	0.232	0.42
032	0.409	0.21	0.484	0.06	3.561	0.78	0.772	0.28	0.242	0.03	0.403	0.05	0.807	0.10	0.040	0.01
033	0.209	0.21	0.157	0.10	0.836	0.21	0.235	0.24	0.444	0.57	0.261	0.00	0.522	0.00	0.026	0.00
034	0.144	0.08	0.144	0.08	0.680	0.13	0.237	0.07	0.356	0.41	0.244	0.02	0.489	0.05	0.129	0.21
035	0.202	0.14	0.268	0.01	0.938	0.04	0.403	0.12	0.201	0.01	0.335	0.01	0.670	0.03	0.033	0.00
036	0.206	0.05	0.251	0.04	0.857	0.11	0.382	0.07	0.154	0.04	0.257	0.06	0.515	0.12	0.046	0.04
037	0.240	0.02	0.297	0.09	0.830	0.41	0.622	0.02	0.180	0.02	0.300	0.03	0.600	0.05	0.030	0.00
038	0.120	0.03	0.167	0.07	0.405	0.13	0.344	0.11	0.234	0.26	0.117	0.10	0.235	0.21	0.036	0.04
039	0.171	0.06	0.287	0.16	0.581	0.46	0.556	0.11	0.377	0.06	0.138	0.07	0.276	0.15	0.031	0.02
040	0.263	0.01	0.196	0.13	0.851	0.38	0.250	0.03	0.197	0.00	0.328	0.01	0.656	0.01	0.033	0.00
041	0.142	0.04	0.142	0.04	0.578	0.32	0.141	0.17	0.151	0.06	0.140	0.13	0.279	0.26	0.037	0.03
042	0.154	0.02	0.254	0.07	0.489	0.33	0.317	0.01	0.136	0.05	0.158	0.05	0.317	0.09	0.016	0.00
043	0.293	0.02	0.195	0.01	1.069	0.33	0.255	0.09	0.265	0.23	0.244	0.01	0.489	0.03	0.046	0.04
044	0.174	0.10	0.118	0.01	0.534	0.17	0.137	0.07	0.177	0.02	0.295	0.03	0.590	0.06	0.030	0.00
045	0.403	0.27	0.358	0.36	1.599	0.32	0.547	0.37	0.486	0.25	0.208	0.03	0.416	0.07	0.063	0.04
080	1.981	0.79	0.773	0.36	10.474	3.79	4.285	1.71	1.483	0.46	0.711	0.10	0.806	0.29	0.020	0.01
081	0.457	0.03	0.287	0.13	0.832	0.01	0.832	0.01	0.685	0.05	0.129	0.04	0.368	0.15	0.013	0.00
082	0.151	0.00	0.151	0.00	0.317	0.03	0.430	0.14	0.196	0.09	0.101	0.05	0.201	0.10	0.010	0.01
0[illegible]	0.272	0.02	0.249	0.03	0.688	0.23	0.795	0.08	0.345	0.06	0.124	0.01	0.249	0.03	0.012	0.00
Ar.Mean	0.276	0.17	0.281	0.14	1.335	0.48	0.541	0.20	0.330	0.15	0.217	0.05	0.424	0.10	0.041	0.04
Std.Dev.	0.313	0.36	0.201	0.17	1.631	0.90	0.696	0.27	0.243	0.19	0.101	0.05	0.147	0.11	0.046	0.08

A R I Z O N A   P U B L I C   S E R V I C E

MONTHLY REPORT for 6-90

AVERAGE DEPOSITION DATA (Pounds per Acre - 30 Days)

and Differences (d)

Location Number	PO4	d	CO3	d	HCO3	d	NH3	d	TSS	d	CU	d	Av d	SD(d)
001	0.004	0.00	1.088	0.17	6.140	10.28	0.064	0.03	16.505	7.41	0.022	0.00	1.30	3.24
002	0.098	0.18	2.075	0.05	9.930	4.74	1.273	2.21	17.340	14.52	0.042	0.00	1.64	3.93
003	0.020	0.01	1.629	0.12	6.806	1.46	0.099	0.07	58.875	17.25	0.033	0.00	1.42	4.57
004	0.006	0.00	1.575	0.19	3.748	4.54	0.093	0.05	41.606	35.07	0.046	0.03	2.91	9.33
005	0.007	0.00	1.779	0.21	3.951	4.13	0.071	0.01	46.046	22.56	0.036	0.00	2.04	6.01
006	0.008	0.00	1.896	0.15	5.642	7.64	0.112	0.07	30.711	17.26	0.056	0.03	1.87	4.86
007	0.009	0.00	2.237	0.44	8.053	1.58	0.277	0.23	55.583	5.03	0.045	0.01	0.56	1.35
008	0.010	0.00	2.581	0.11	7.379	9.48	0.103	0.00	7.592	10.14	0.052	0.00	1.47	3.54
009	0.012	0.00	3.075	0.05	7.105	8.11	0.123	0.00	46.720	4.16	0.092	0.06	0.93	2.34
010	0.023	0.02	1.737	1.88	8.820	8.04	0.325	0.44	23.920	13.60	0.043	0.02	1.79	4.00
011	0.012	0.00	1.731	1.11	8.310	5.34	0.069	0.04	41.655	57.69	0.035	0.02	4.71	15.31
012	0.009	999.99	2.225	999.99	2.225	999.99	0.089	999.99	30.260	999.99	0.045	999.99	999.99	999.99
013	0.115	0.14	2.056	2.54	12.810	14.28	0.947	1.83	16.835	24.85	0.041	0.05	3.53	7.14
014	0.010	0.01	2.619	1.61	6.063	5.28	0.105	0.06	14.745	3.39	0.052	0.03	0.82	1.59
015	0.033	0.04	2.700	0.95	4.923	5.40	0.197	0.14	16.770	12.18	0.054	0.02	1.38	3.42
016	0.022	0.04	0.961	0.14	5.147	0.39	0.234	0.39	54.375	23.25	0.028	0.02	1.77	6.18
017	0.008	0.00	1.984	0.19	5.894	1.80	0.196	0.06	43.219	13.20	0.040	0.00	1.13	3.51
018	0.006	0.00	1.524	0.10	5.487	0.35	0.122	0.01	37.379	43.31	0.030	0.00	3.20	11.55
019	0.176	0.26	1.331	0.15	19.829	2.61	0.053	0.01	255.097	83.61	0.027	0.00	6.60	22.21
020	0.168	0.15	1.039	0.11	5.580	0.67	0.530	0.36	43.363	9.45	0.021	0.00	0.81	[illegible]
021	0.075	0.09	2.211	0.49	4.766	4.62	0.275	0.24	24.569	13.76	0.044	0.01	1.43	[illegible]
022	0.049	0.08	2.664	0.10	6.059	6.69	0.107	0.00	30.672	22.24	0.053	0.00	2.11	6.06
023	999.999	999.99	999.999	999.99	999.999	999.99	999.999	999.99	999.999	999.99	999.999	999.99	999.99	999.99
024	0.028	0.00	2.338	0.22	5.522	6.59	0.094	0.01	41.420	54.36	0.071	0.05	4.62	14.43
025	0.052	0.01	1.850	0.30	1.850	0.30	0.330	0.02	51.520	16.64	0.054	0.03	1.33	4.41
026	0.038	0.06	2.444	0.13	2.444	0.13	0.098	0.01	41.959	3.64	0.074	0.05	0.32	0.96
027	0.005	0.00	1.189	0.41	4.281	1.47	0.048	0.02	17.031	0.63	0.034	0.01	0.20	0.41
028	0.007	0.00	1.815	0.05	8.710	0.23	0.109	0.08	34.935	15.45	0.036	0.00	1.21	4.10
030	0.169	0.09	2.008	0.77	12.513	9.46	0.128	0.13	112.597	4.74	0.040	0.02	1.23	2.66
031	0.036	0.05	2.470	0.59	10.508	15.48	0.099	0.02	41.959	30.79	0.049	0.01	3.53	8.83
032	0.033	0.04	4.034	0.52	14.524	1.86	0.161	0.02	77.048	2.98	0.081	0.01	0.50	0.87
033	0.010	0.00	2.612	0.00	2.612	0.00	0.209	0.21	31.345	4.18	0.052	0.00	0.41	1.10
034	0.010	0.00	2.444	0.23	2.444	0.23	0.098	0.01	18.248	11.92	0.072	0.04	0.96	3.15
035	0.041	0.06	3.349	0.13	3.349	0.13	0.134	0.01	37.666	17.52	0.067	0.00	1.30	4.67
036	0.010	0.00	2.573	0.59	2.573	0.59	0.103	0.02	51.745	34.30	0.051	0.01	2.58	9.13
037	0.023	0.02	3.000	0.26	3.000	0.26	0.235	0.22	49.567	6.51	0.091	0.07	0.57	1.71
038	0.012	0.00	1.173	1.04	2.415	1.44	0.178	0.22	34.326	15.35	0.030	0.01	1.36	4.05
039	0.019	0.01	1.379	0.73	5.574	1.39	0.253	0.23	48.019	9.64	0.055	0.03	0.94	2.53
040	0.033	0.04	3.281	0.06	3.281	0.06	0.131	0.00	18.400	5.60	0.066	0.00	0.45	1.48
041	0.010	0.00	1.397	1.29	2.372	0.66	0.131	0.10	16.324	9.85	0.028	0.03	0.93	2.59
042	0.079	0.07	1.585	0.46	3.346	3.06	0.307	0.47	41.468	7.06	0.032	0.01	0.84	1.96
043	0.025	0.03	2.444	0.15	10.306	3.54	0.391	0.02	21.387	6.54	0.049	0.00	0.79	1.90
044	0.017	0.01	2.950	0.30	6.980	8.36	0.118	0.01	14.280	6.16	0.059	0.01	1.09	2.65
045	0.121	0.17	2.081	0.34	8.637	1.07	0.670	0.80	49.345	26.69	0.042	0.01	2.20	7.06
080	0.043	0.05	2.014	0.73	43.431	23.50	0.081	0.03	267.729	73.46	0.040	0.01	7.52	19.95
081	0.070	0.10	1.289	0.38	7.073	3.57	0.428	0.33	66.281	9.19	0.026	0.01	1.00	[illegible]
082	0.014	0.01	1.007	0.51	3.176	2.75	0.040	0.02	49.371	32.74	0.020	0.01	2.60	[illegible]
083	0.018	0.02	1.243	0.13	5.104	3.93	0.050	0.01	44.846	8.61	0.025	0.00	0.94	[illegible]
Ar.Mean	0.038	0.04	2.057	0.46	7.036	4.29	0.215	0.20	47.503	18.88	0.046	0.02	1.80	5.23
Std.dev.	0.045	0.06	0.697	0.52	6.523	4.79	0.233	0.43	49.375	18.30	0.018	0.02	1.55	4.80

ARIZONA PUBLIC SERVICE
MONTHLY REPORT for 6-90

DEPOSITION DATA
Comments and Messages Only

Location Number	Sample A Comments	Sample B Comments	Processing Messages
001			
002			
003			
004			
005			
006			
007			
008			
009			
010			
011			
012	VOID - POSSIBLE CONTAMINATION		MISSING SAMPLE A
013	SCREEN MISSING	SCREEN MISSING	
014			
015			
016			
017			
018			
019			
020			
[illegible]			
[illegible]			
023	VOID - POSSIBLE CONTAMINATION	VOID/VANDALISM	MISSING SAMPLE A and B
024			
025			
026			
027			
028			
030			
031			
032			
033			
034			
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039			
040			
041			
042			
043			
044			
045			
080			
081			
08[illegible]			
0[illegible]			

A R I Z O N A   P U B L I C   S E R V I C E

MONTHLY REPORT for 7-90

AVERAGE DEPOSITION DATA (Pounds per Acre - 30 Days)

and Differences (d)

Location Number	Na	d	K	d	Ca	d	Mg	d	Cl	d	F	d	SO4	d	NO3	d
001	0.584	0.09	0.613	0.28	2.983	0.57	1.240	0.22	0.809	0.27	0.391	0.03	0.483	0.29	0.034	0.03
002	0.396	0.12	0.684	0.09	3.570	2.86	1.470	0.21	0.526	0.04	0.184	0.09	0.368	0.17	0.018	0.01
003	4.185	7.09	0.710	0.08	4.171	1.07	1.340	0.53	0.660	0.25	0.274	0.01	0.548	0.03	0.114	0.17
004	1.492	1.72	0.528	0.16	3.022	1.34	1.067	0.15	0.573	0.07	0.197	0.06	0.393	0.11	0.020	0.01
005	0.879	0.35	0.290	0.05	5.100	1.41	0.600	0.32	0.712	0.16	0.242	0.04	0.484	0.09	0.024	0.00
006	3.833	5.24	0.693	0.31	4.041	0.09	1.376	0.88	1.029	0.12	0.286	0.03	0.841	0.47	0.029	0.00
007	0.427	0.20	0.322	0.01	9.918	4.30	0.553	0.08	0.427	0.20	0.268	0.01	0.537	0.02	0.027	0.00
008	0.693	0.43	0.216	0.02	3.140	0.15	0.404	0.01	0.501	0.09	0.227	0.11	0.455	0.22	0.023	0.01
009	1.186	0.44	0.465	0.23	5.510	2.11	0.795	0.53	0.514	0.32	0.267	0.05	0.534	0.10	0.027	0.01
010	0.891	0.69	0.440	0.00	2.359	3.84	1.034	0.22	0.303	0.28	0.247	0.05	0.495	0.11	0.025	0.01
011	999.999	999.99	999.999	999.99	999.999	999.99	999.999	999.99	999.999	999.99	999.999	999.99	999.999	999.99	999.999	999.99
012	1.211	1.36	2.034	1.42	1.564	0.66	2.127	1.03	0.596	0.13	0.229	0.02	2.114	3.35	0.023	0.00
013	0.771	0.19	1.317	1.19	7.692	2.39	1.969	2.81	0.530	0.38	0.321	0.08	0.642	0.16	0.032	0.01
014	0.839	0.27	0.672	0.66	12.127	1.83	1.419	1.38	0.667	0.13	0.186	0.13	0.738	0.47	0.088	0.13
015	0.483	999.99	0.579	999.99	4.538	999.99	0.966	999.99	0.579	999.99	0.241	999.99	0.483	999.99	0.024	999.99
016	0.601	0.17	0.585	0.14	4.639	3.26	1.587	0.21	0.539	0.05	0.130	0.02	0.377	0.19	0.026	0.02
017	0.262	0.02	0.267	0.37	1.483	0.09	0.457	0.51	0.262	0.02	0.219	0.01	0.437	0.03	0.022	0.00
018	0.370	0.05	0.448	0.48	2.248	0.61	0.672	0.82	0.370	0.05	0.209	0.07	0.419	0.14	0.054	0.06
019	0.526	0.06	1.370	1.25	6.372	1.45	2.090	2.46	0.370	0.37	0.294	0.03	0.588	0.07	0.029	0.00
020	0.642	0.10	0.584	0.34	2.932	1.34	1.035	0.84	0.723	0.06	0.154	0.04	0.442	0.19	0.015	0.00
0[illegible]	0.383	999.99	0.478	999.99	1.912	999.99	0.755	999.99	0.383	999.99	0.239	999.99	0.478	999.99	0.024	999.99
0[illegible]	0.326	0.00	0.489	0.11	2.393	0.22	0.533	0.46	0.245	0.16	0.272	0.00	0.544	0.00	0.027	0.00
023	2.319	2.31	2.145	2.18	15.442	8.38	3.571	4.76	1.952	1.84	0.350	0.05	1.078	0.86	0.035	0.01
024	0.405	0.04	0.442	0.46	2.936	0.33	0.745	0.81	0.399	0.16	0.253	0.03	0.506	0.06	0.025	0.00
025	0.436	999.99	0.262	999.99	3.313	999.99	0.296	999.99	0.523	999.99	0.218	999.99	0.872	999.99	0.022	999.99
026	0.344	0.11	0.341	0.28	2.055	0.33	0.608	0.58	0.219	0.14	0.245	0.01	0.490	0.01	0.024	0.00
027	0.777	0.10	0.771	0.32	2.103	3.61	1.061	0.47	0.564	0.26	0.083	0.05	0.776	0.19	0.023	0.02
028	0.529	0.26	0.601	0.07	7.998	6.60	1.195	0.32	0.348	0.06	0.217	0.04	0.434	0.07	0.022	0.00
030	0.826	0.12	1.059	0.79	5.120	5.03	1.948	1.46	0.940	0.11	0.234	0.09	0.659	0.21	0.152	0.25
031	0.585	0.02	0.689	0.93	4.396	0.94	1.351	1.92	0.626	0.07	0.196	0.02	0.577	0.33	0.244	0.45
032	1.168	0.21	1.031	0.85	9.146	4.62	1.336	0.82	1.107	0.70	0.417	0.07	0.834	0.15	0.042	0.01
033	0.343	0.00	0.556	0.59	2.702	0.06	0.996	1.08	0.193	0.13	0.214	0.00	1.076	1.30	0.021	0.00
034	0.275	0.00	0.355	0.02	1.881	0.12	0.572	0.03	0.240	0.06	0.200	0.05	0.401	0.11	0.151	0.16
035	0.297	0.06	0.462	0.49	1.868	0.21	0.611	0.72	0.148	0.03	0.247	0.05	0.495	0.11	0.025	0.01
036	0.231	0.00	0.461	0.46	1.768	0.00	0.865	1.19	0.211	0.19	0.192	0.00	0.384	0.00	0.019	0.00
037	0.210	0.00	0.263	0.32	0.945	0.00	0.394	0.45	0.341	0.37	0.263	0.00	0.525	0.00	0.026	0.00
038	0.364	0.06	0.289	0.41	2.101	0.55	0.519	0.72	0.364	0.06	0.227	0.04	0.455	0.08	0.194	0.35
039	0.278	0.06	0.216	0.18	0.936	0.48	0.377	0.37	0.270	0.08	0.174	0.04	0.348	0.08	0.017	0.00
040	0.459	0.10	0.664	0.31	3.216	0.31	1.002	0.65	0.300	0.22	0.287	0.06	0.574	0.13	0.029	0.01
041	0.391	0.03	0.426	0.29	4.560	1.94	0.874	0.70	0.432	0.11	0.219	0.03	0.438	0.06	0.183	0.32
042	0.325	0.01	0.448	0.09	1.768	0.79	0.812	0.14	0.353	0.06	0.169	0.06	0.338	0.13	0.017	0.01
043	0.568	0.04	0.513	0.15	1.812	0.08	0.641	0.24	0.627	0.16	0.284	0.02	0.568	0.04	0.120	0.19
044	0.420	0.21	0.420	0.00	2.153	0.10	0.803	0.05	0.420	0.21	0.263	0.00	0.525	0.00	0.165	0.28
045	0.513	0.12	0.418	0.07	2.935	0.73	0.805	0.39	0.456	0.23	0.261	0.05	0.522	0.09	0.026	0.00
080	2.147	0.25	1.486	1.07	35.586	4.55	4.628	2.36	1.467	0.16	0.306	0.02	1.226	0.07	0.031	0.00
081	1.387	0.01	0.483	0.47	4.560	0.72	1.433	0.73	1.420	0.44	0.178	0.05	1.420	0.44	0.031	0.02
08[illegible]	0.502	999.99	0.803	999.99	6.021	999.99	0.963	999.99	0.401	999.99	0.251	999.99	0.502	999.99	0.025	999.99
0[illegible]	0.574	999.99	0.306	999.99	4.593	999.99	0.880	999.99	0.689	999.99	0.096	999.99	0.766	999.99	0.010	999.99
Ar.Mean	0.801	0.54	0.632	0.43	4.758	1.67	1.123	0.82	0.560	0.21	0.237	0.04	0.621	0.26	0.051	0.06
Std.Dev.	0.820	1.37	0.423	0.46	5.450	1.98	0.789	0.90	0.354	0.29	0.064	0.03	0.321	0.54	0.056	0.11

A R I Z O N A P U B L I C S E R V I C E

MONTHLY REPORT for 7-90

AVERAGE DEPOSITION DATA (Pounds per Acre - 30 Days)
and Differences (d)

Location Number	PO4	d	CO3	d	HCO3	d	NH3	d	TSS	d	CU	d	Av d	SD(d)
001	0.086	0.10	1.629	0.12	16.941	1.22	0.222	0.31	106.687	37.88	0.033	0.00	2.96	10.05
002	0.080	0.06	1.840	0.87	19.134	9.02	0.316	0.27	152.391	113.53	0.037	0.02	9.10	30.16
003	0.061	0.08	2.738	0.13	10.490	8.14	0.222	0.23	115.100	16.20	0.083	0.06	2.43	4.79
004	0.035	0.05	1.966	0.57	12.574	1.75	0.460	0.56	114.517	13.03	0.056	0.02	1.40	3.41
005	0.038	0.01	2.418	0.44	25.148	4.57	0.317	0.42	165.310	49.24	0.048	0.01	4.08	13.05
006	0.035	0.03	2.858	0.34	19.097	10.22	0.471	0.51	141.207	40.34	0.087	0.07	4.19	10.80
007	0.042	0.04	2.684	0.12	38.189	9.18	0.107	0.00	112.538	38.17	0.054	0.00	3.74	10.25
008	0.015	0.02	2.273	1.13	14.217	1.06	0.091	0.05	60.759	12.62	0.045	0.02	1.14	3.33
009	0.064	0.10	2.672	0.52	24.272	1.67	0.155	0.08	128.250	24.75	0.053	0.01	2.21	6.52
010	0.026	0.04	2.473	0.54	15.942	3.37	0.099	0.02	109.969	44.44	0.049	0.01	3.83	11.76
011	999.999	999.99	999.999	999.99	999.999	999.99	999.999	999.99	999.999	999.99	999.999	999.99	999.99	999.99
012	0.079	0.09	2.285	0.16	14.967	5.32	0.268	0.35	215.625	61.12	0.046	0.00	5.36	16.12
013	0.027	0.03	3.211	0.80	36.375	15.00	0.128	0.03	169.950	155.10	0.064	0.02	12.73	41.16
014	0.097	0.05	1.863	1.29	45.253	1.78	0.618	0.03	121.266	18.28	0.037	0.03	1.89	4.76
015	0.039	999.99	2.414	999.99	12.553	999.99	0.097	999.99	79.181	999.99	0.048	999.99	999.99	999.99
016	0.051	0.07	1.300	0.25	18.635	7.19	0.217	0.32	92.600	2.80	0.026	0.00	1.05	2.06
017	0.030	0.01	2.185	0.13	8.664	4.73	0.087	0.01	56.048	10.30	0.044	0.00	1.16	2.91
018	0.026	0.03	2.095	0.72	16.759	5.79	0.321	0.05	94.190	8.17	0.042	0.01	1.22	2.50
019	0.102	0.07	2.941	0.35	30.581	3.60	0.429	0.64	230.400	62.32	0.059	0.01	5.19	16.48
020	0.046	0.01	1.539	0.39	16.003	4.03	0.062	0.02	102.724	44.07	0.031	0.01	3.67	[illegible]
021	0.038	999.99	2.391	999.99	12.431	999.99	0.191	999.99	93.712	999.99	0.048	999.99	999.99	[illegible]
022	0.060	0.05	2.719	0.00	10.875	6.53	0.381	0.33	66.881	29.36	0.054	0.00	2.66	[illegible]
023	0.469	0.42	3.504	0.54	53.907	11.15	0.507	0.50	515.431	177.41	0.070	0.01	15.03	46.86
024	0.041	0.02	2.531	0.28	10.294	7.20	0.149	0.08	74.081	14.29	0.051	0.01	1.70	4.08
025	0.061	999.99	2.180	999.99	17.438	999.99	0.349	999.99	139.500	999.99	0.044	999.99	999.99	999.99
026	0.034	0.03	2.449	0.07	12.736	0.37	0.247	0.30	101.147	36.21	0.049	0.00	2.75	9.63
027	0.025	0.02	0.828	0.52	12.983	1.84	0.204	0.32	69.828	16.76	0.017	0.01	1.75	4.43
028	0.013	0.01	2.172	0.36	27.517	18.39	0.087	0.01	108.259	9.41	0.043	0.01	2.54	5.41
030	0.144	0.11	2.341	0.85	27.021	3.52	0.706	1.19	167.638	47.48	0.066	0.02	4.37	12.49
031	0.063	0.04	1.957	0.21	18.131	6.64	0.396	0.20	133.491	145.52	0.039	0.00	11.23	38.69
032	0.088	0.07	4.172	0.75	51.563	42.38	0.531	0.76	70.763	119.70	0.083	0.02	12.22	32.88
033	0.030	0.01	2.145	0.02	11.152	0.12	0.258	0.35	48.504	92.74	0.043	0.00	6.89	24.71
034	0.028	0.00	2.004	0.54	7.992	7.66	0.206	0.13	43.116	2.57	0.092	0.09	0.83	2.08
035	0.040	0.01	2.473	0.54	12.858	2.80	0.275	0.33	79.359	3.62	0.049	0.01	0.64	1.12
036	0.046	0.03	1.922	0.00	9.994	0.00	0.192	0.23	73.800	52.27	0.038	0.00	3.88	13.93
037	0.021	0.02	2.625	0.00	6.825	1.05	0.210	0.21	47.775	17.85	0.053	0.00	1.45	4.73
038	0.027	0.00	2.275	0.40	8.860	3.86	0.240	0.31	55.940	1.00	0.046	0.01	0.56	1.00
039	0.010	0.00	1.738	0.38	4.555	1.67	0.194	0.23	39.070	11.18	0.035	0.01	1.05	2.95
040	0.057	0.01	2.871	0.63	14.930	3.29	0.319	0.38	82.172	29.46	0.057	0.01	2.54	7.79
041	0.021	0.02	2.191	0.30	20.344	8.06	0.432	0.11	91.594	12.56	0.044	0.01	1.75	3.77
042	0.040	0.06	1.688	0.63	8.775	3.25	0.068	0.03	62.600	6.80	0.048	0.01	0.86	1.91
043	0.082	0.14	2.838	0.22	10.940	8.80	0.881	1.54	49.490	18.74	0.057	0.00	2.17	5.30
044	0.047	0.01	2.625	0.00	6.825	1.05	0.210	0.21	65.100	29.40	0.053	0.00	2.25	7.82
045	0.037	0.02	2.612	0.47	13.583	2.42	0.370	0.17	104.172	58.14	0.052	0.01	4.49	15.45
080	0.012	0.00	3.065	0.18	114.983	72.93	0.123	0.01	257.793	39.72	0.061	0.00	8.67	21.26
081	0.025	0.03	1.775	0.55	18.100	3.40	0.311	0.46	124.800	45.60	0.036	0.01	3.78	12.07
082	0.010	999.99	2.509	999.99	26.090	999.99	0.100	999.99	120.414	999.99	0.050	999.99	999.99	[illegible]
083	0.004	999.99	0.957	999.99	15.310	999.99	0.038	999.99	141.621	999.99	0.019	999.99	999.99	[illegible]
Ar.Mean	0.054	0.05	2.318	0.41	20.485	7.52	0.274	0.29	114.825	42.15	0.050	0.01	3.89	11.67
Std.dev.	0.068	0.07	0.605	0.30	17.978	12.49	0.178	0.31	76.859	42.95	0.016	0.02	3.55	11.38

A R I Z O N A   P U B L I C   S E R V I C E
MONTHLY REPORT for 7-90

DEPOSITION DATA
Comments and Messages Only

Location Number	Sample A Comments	Sample B Comments	Processing Messages
001			
002			
003			
004			
005			
006			
007			
008			
009			
010			
011	VOID/CONTAINER BLOWN OVER BY STORM	VOID/CONTAINER BLOWN OVER BY STORM	MISSING SAMPLE A and B
012			
013			
014			
015	VOID/DEAD BIRD IN CONTAINER		MISSING SAMPLE A
016			
017			
018			
019			
020			
[illegible]		VOID/DEAD BIRD IN CONTAINER	MISSING SAMPLE B
0[illegible]			
023			
024			
025		VOID/POSSIBLE CONTAMINATION	MISSING SAMPLE B
026			
027			
028			
030			
031			
032			
033			
034			
035			
036			
037			
038			
039			
040			
041			
042			
043			
044			
045			
080			
081			
08[illegible]	VOID/CONTAINER BLOWN OVER BY STORM		MISSING SAMPLE A
0[illegible]	VOID/CONTAINER BLOWN OVER BY STORM		MISSING SAMPLE A

A R I Z O N A P U B L I C S E R V I C E
MONTHLY REPORT for 8-90

AVERAGE DEPOSITION DATA (Pounds per Acre - 30 Days)
and Differences (d)

Location Number	Na	d	K	d	Ca	d	Mg	d	Cl	d	F	d	SO4	d	NO3	d
001	999.999	999.99	999.999	999.99	999.999	999.99	999.999	999.99	999.999	999.99	999.999	999.99	999.999	999.99	999.999	999.99
002	0.807	0.04	0.349	0.01	0.577	0.01	0.428	0.36	1.019	0.04	0.067	0.01	0.935	0.15	0.111	0.21
003	1.022	0.11	0.726	0.59	2.555	0.27	1.452	1.08	1.426	0.27	0.134	0.00	1.076	0.00	0.013	0.00
004	0.241	0.04	0.438	0.01	2.744	0.41	0.732	0.03	0.355	0.16	0.177	0.08	0.355	0.16	0.018	0.01
005	0.334	999.99	0.418	999.99	2.340	999.99	0.652	999.99	0.334	999.99	0.209	999.99	0.418	999.99	0.021	999.99
006	0.373	0.06	0.534	0.38	2.123	0.07	1.009	0.55	0.503	0.20	0.208	0.01	1.063	1.32	0.333	0.63
007	0.327	0.11	0.511	0.07	0.972	1.10	0.782	0.22	0.474	0.00	0.150	0.18	0.486	0.02	0.265	0.02
008	0.479	0.05	0.395	0.12	1.663	0.30	0.576	0.18	0.428	0.35	0.399	0.04	0.798	0.09	0.040	0.00
009	0.709	0.07	0.868	0.00	2.265	0.67	1.784	0.10	0.868	0.00	0.275	0.07	0.551	0.14	0.154	0.26
010	0.720	0.01	0.718	0.57	2.160	0.32	1.442	1.41	0.864	0.30	0.360	0.00	0.720	0.01	0.036	0.00
011	0.678	0.12	1.287	0.22	5.116	1.54	2.120	0.41	0.756	0.04	0.378	0.02	0.756	0.04	0.181	0.29
012	0.554	0.02	1.315	0.09	4.571	0.17	2.284	0.05	0.314	0.22	0.346	0.01	0.693	0.03	0.035	0.00
013	0.460	0.11	1.073	0.26	4.801	0.69	1.925	0.61	0.399	0.28	0.383	0.09	0.766	0.18	0.038	0.01
014	1.576	999.99	0.577	999.99	2.960	999.99	1.076	999.99	1.768	999.99	0.096	999.99	1.153	999.99	0.010	999.99
015	0.295	0.04	0.642	0.18	2.030	0.09	1.125	0.26	0.313	0.21	0.304	0.08	0.607	0.17	0.030	0.01
016	1.453	0.30	0.486	0.09	2.275	0.06	1.093	0.09	1.580	0.37	0.049	0.02	1.143	0.04	0.005	0.00
017	0.477	0.07	0.802	0.50	0.809	0.25	0.998	0.51	0.573	0.06	0.120	0.10	0.560	0.02	0.020	0.03
018	0.437	0.06	0.404	0.01	0.471	0.01	0.515	0.06	0.571	0.05	0.168	0.00	0.336	0.01	0.090	0.15
019	0.698	0.04	2.278	0.40	1.727	0.39	3.150	0.27	0.840	0.12	0.121	0.02	0.485	0.07	0.046	0.00
020	1.880	0.39	0.536	0.13	0.444	0.06	0.399	0.12	2.129	0.07	0.142	0.05	1.934	0.18	0.151	0.14
[illegible]	0.286	0.01	0.388	0.05	0.529	0.31	0.591	0.19	1.174	1.54	0.102	0.00	0.928	1.45	0.108	0.20
[illegible]	0.304	0.06	0.360	0.17	0.221	0.22	0.274	0.29	0.360	0.17	0.138	0.00	0.415	0.28	0.134	0.24
023	1.228	0.43	3.801	1.28	3.105	2.67	6.234	4.63	1.172	0.32	0.297	0.04	0.594	0.08	0.100	0.02
024	0.326	0.02	0.812	0.05	1.379	1.63	1.272	0.38	0.326	0.02	0.271	0.02	0.543	0.04	0.027	0.00
025	0.252	999.99	0.839	999.99	2.265	999.99	1.426	999.99	0.336	999.99	0.210	999.99	0.420	999.99	0.021	999.99
026	0.282	999.99	0.377	999.99	1.036	999.99	0.471	999.99	0.377	999.99	0.235	999.99	0.471	999.99	0.179	999.99
027	0.238	0.06	0.549	0.36	1.013	0.77	1.013	0.77	0.264	0.00	0.149	0.03	0.297	0.07	0.015	0.00
028	0.318	999.99	0.318	999.99	1.325	999.99	0.488	999.99	0.371	999.99	0.133	999.99	0.265	999.99	0.276	999.99
030	0.676	0.01	1.038	0.06	1.312	1.07	1.375	0.95	0.899	0.05	0.226	0.03	0.453	0.07	0.023	0.00
031	0.301	999.99	0.552	999.99	0.753	999.99	0.753	999.99	0.401	999.99	0.125	999.99	0.502	999.99	0.055	999.99
032	0.677	0.04	1.039	0.22	3.637	3.67	2.055	0.15	0.356	0.22	0.350	0.12	0.701	0.24	0.035	0.01
033	0.254	0.05	0.312	0.07	0.630	0.68	0.477	0.02	0.278	0.14	0.159	0.03	0.463	0.23	0.250	0.03
034	0.267	0.05	0.267	0.05	0.587	0.56	0.457	0.32	0.297	0.02	0.167	0.03	0.334	0.06	0.243	0.04
035	0.292	0.04	0.531	0.02	0.956	1.01	0.774	0.27	0.213	0.11	0.243	0.04	0.486	0.07	0.024	0.00
036	0.159	0.03	0.269	0.03	0.177	0.01	0.379	0.11	0.208	0.02	0.061	0.06	0.215	0.07	0.110	0.20
037	0.266	0.03	0.476	0.06	0.720	0.68	0.794	0.20	0.325	0.02	0.149	0.02	0.297	0.04	0.015	0.00
038	0.318	0.00	0.322	0.09	0.235	0.27	0.254	0.28	0.344	0.05	0.084	0.10	0.349	0.17	0.056	0.09
039	0.326	0.02	0.429	0.08	0.258	0.05	0.325	0.02	0.344	0.02	0.086	0.00	0.344	0.02	0.038	0.06
040	0.244	0.16	0.812	0.32	2.439	0.30	1.381	0.44	0.244	0.00	0.407	0.00	0.813	0.01	0.041	0.00
041	0.480	0.10	0.331	0.05	1.322	0.21	0.674	0.22	0.625	0.03	0.184	0.01	0.369	0.02	0.165	0.20
042	0.333	0.14	0.258	0.09	0.242	0.32	0.269	0.41	0.425	0.15	0.208	0.09	0.499	0.01	0.015	0.02
043	0.573	0.21	0.526	0.31	0.573	0.21	0.531	0.30	0.779	0.25	0.258	0.05	0.516	0.10	0.138	0.11
044	0.319	0.02	0.716	0.12	2.471	0.01	1.137	0.20	0.239	0.01	0.399	0.02	0.798	0.05	0.040	0.00
045	0.451	0.18	0.343	0.04	0.469	0.36	0.291	0.21	0.551	0.09	0.158	0.05	0.316	0.09	0.116	0.20
080	4.816	1.22	1.746	0.32	18.619	2.83	5.257	2.31	1.345	0.49	0.291	0.08	2.826	0.36	0.029	0.01
081	3.650	0.71	0.532	0.15	2.053	1.06	0.925	0.38	3.852	1.12	0.095	0.06	2.788	0.51	0.010	0.01
082	0.504	0.03	0.432	0.02	0.650	0.18	0.600	0.15	0.576	0.03	0.180	0.01	0.360	0.02	0.153	0.27
[illegible]	1.359	0.78	0.473	0.08	1.946	0.02	0.919	0.16	1.422	0.17	0.263	0.01	1.053	0.05	0.234	0.42
Ar.Mean	0.703	0.15	0.706	0.19	1.990	0.62	1.169	0.48	0.715	0.19	0.207	0.04	0.707	0.16	0.090	0.09
Std.Dev.	0.854	0.24	0.607	0.23	2.767	0.81	1.156	0.79	0.653	0.29	0.101	0.04	0.549	0.30	0.086	0.14

ARIZONA PUBLIC SERVICE

MONTHLY REPORT for 8-90

AVERAGE DEPOSITION DATA (Pounds per Acre - 30 Days)

and Differences (d)

Location Number	PO4	d	CO3	d	HCO3	d	NH3	d	TSS	d	CU	d	Av d	SD(d)
001	999.999	999.99	999.999	999.99	999.999	999.99	999.999	999.99	999.999	999.99	999.999	999.99	999.99	999.99
002	0.019	0.03	0.674	0.08	6.023	0.61	0.166	0.28	58.523	25.92	0.013	0.00	1.98	6.89
003	0.005	0.00	1.345	0.00	11.297	2.15	0.054	0.00	145.241	107.59	0.027	0.00	8.00	28.67
004	0.007	0.00	1.775	0.79	13.211	6.56	0.071	0.03	62.057	30.39	0.035	0.02	2.76	8.13
005	0.008	999.99	2.089	999.99	10.029	999.99	0.084	999.99	48.471	999.99	0.042	999.99	999.99	999.99
006	0.026	0.04	2.083	0.15	9.193	2.31	0.170	0.18	100.784	87.72	0.063	0.05	6.69	23.33
007	0.028	0.04	1.500	1.76	7.862	3.31	0.391	0.21	72.538	11.01	0.049	0.00	1.29	2.95
008	0.016	0.00	3.990	0.43	16.134	8.12	0.160	0.02	45.853	10.93	0.080	0.01	1.47	3.46
009	0.048	0.08	2.754	0.68	11.981	0.79	0.172	0.15	114.984	17.53	0.128	0.13	1.48	4.63
010	0.036	0.04	3.598	0.05	11.531	5.91	0.144	0.00	96.127	87.97	0.072	0.00	6.90	23.38
011	0.093	0.16	3.779	0.20	19.533	8.03	0.384	0.47	142.341	25.63	0.076	0.00	2.66	6.94
012	0.014	0.00	3.463	0.13	25.638	2.34	0.139	0.01	214.570	5.86	0.069	0.00	0.64	1.62
013	0.024	0.02	3.832	0.91	19.069	3.04	0.153	0.04	102.403	5.79	0.077	0.02	0.86	1.62
014	0.004	999.99	0.961	999.99	12.684	999.99	0.038	999.99	73.031	999.99	0.038	999.99	999.99	999.99
015	0.044	0.06	3.035	0.84	15.091	3.00	0.226	0.18	89.602	29.86	0.061	0.02	2.50	7.91
016	0.002	0.00	0.491	0.18	10.513	1.78	0.129	0.16	69.026	3.05	0.020	0.01	0.44	0.88
017	0.031	0.01	0.700	0.03	15.792	2.51	0.124	0.19	169.200	140.40	0.014	0.00	10.34	37.44
018	0.007	0.00	1.681	0.04	5.395	2.81	0.067	0.00	76.205	20.49	0.034	0.00	1.69	5.46
019	0.094	0.01	1.213	0.17	32.095	0.29	0.048	0.01	305.050	97.10	0.024	0.00	7.06	25.91
020	0.041	0.03	1.420	0.54	11.711	2.23	0.445	0.22	71.679	5.14	0.028	0.01	0.66	[illegible]
021	0.045	0.01	1.022	0.03	9.197	0.64	0.289	0.42	63.310	2.48	0.031	0.02	0.52	[illegible]
022	0.014	0.02	1.384	0.00	6.088	1.11	0.166	0.22	66.414	0.00	0.042	0.03	0.20	0.28
023	0.212	0.20	2.969	0.39	54.393	0.01	0.538	0.19	606.775	429.25	0.087	0.05	31.40	114.52
024	0.011	0.00	2.713	0.20	11.897	1.29	0.109	0.01	119.766	30.47	0.054	0.00	2.44	8.08
025	0.042	999.99	2.098	999.99	10.069	999.99	0.252	999.99	167.813	999.99	0.084	999.99	999.99	999.99
026	0.009	999.99	2.353	999.99	7.531	999.99	0.377	999.99	71.545	999.99	0.047	999.99	999.99	999.99
027	0.006	0.00	1.487	0.35	7.923	0.10	0.059	0.01	103.875	71.25	0.030	0.01	5.27	18.99
028	0.164	999.99	1.325	999.99	16.430	999.99	0.159	999.99	63.600	999.99	0.027	999.99	999.99	999.99
030	0.046	0.02	2.263	0.33	22.915	1.21	0.139	0.11	174.850	19.90	0.045	0.01	1.70	5.26
031	0.045	999.99	1.254	999.99	16.557	999.99	0.452	999.99	95.328	999.99	0.025	999.99	999.99	999.99
032	0.050	0.03	3.504	1.19	29.304	0.42	0.257	0.19	218.457	87.78	0.070	0.02	6.74	23.34
033	0.024	0.03	1.591	0.28	7.810	1.76	0.492	0.29	54.859	29.32	0.032	0.01	2.35	7.77
034	0.013	0.01	1.668	0.28	5.948	0.31	0.431	0.01	49.376	8.42	0.051	0.04	0.73	2.22
035	0.010	0.00	2.431	0.36	8.679	0.64	0.097	0.01	90.248	17.50	0.049	0.01	1.44	4.63
036	0.006	0.01	0.608	0.59	4.267	2.33	0.176	0.15	53.276	5.17	0.034	0.03	0.63	1.44
037	0.050	0.01	1.487	0.18	8.922	1.09	0.416	0.05	92.379	17.17	0.091	0.07	1.40	4.55
038	0.018	0.01	0.841	0.96	6.921	5.15	0.152	0.01	53.379	19.86	0.020	0.01	1.93	5.33
039	0.014	0.02	0.860	0.04	8.286	3.12	0.172	0.01	89.948	102.52	0.034	0.00	7.57	27.34
040	0.041	0.02	4.066	0.05	8.565	9.04	0.163	0.00	125.105	47.35	0.081	0.00	4.12	12.67
041	0.018	0.01	1.843	0.12	8.775	3.86	0.366	0.12	49.647	3.49	0.037	0.00	0.60	1.31
042	0.008	0.00	1.461	2.09	2.082	0.85	0.058	0.08	36.745	9.27	0.166	0.23	0.98	2.45
043	0.101	0.18	2.580	0.50	9.691	10.07	0.670	1.15	59.524	25.94	0.052	0.01	2.82	7.16
044	0.016	0.00	3.990	0.25	14.414	4.08	0.160	0.01	95.470	13.25	0.080	0.00	1.29	3.61
045	0.028	0.05	1.581	0.46	11.655	2.79	0.172	0.24	68.450	3.50	0.032	0.01	0.59	1.10
080	0.012	0.00	2.906	0.80	65.818	4.61	0.116	0.03	369.161	103.18	0.058	0.02	8.30	27.34
081	0.004	0.00	0.950	0.63	8.617	3.04	0.038	0.03	93.776	35.48	0.025	0.00	3.08	[illegible]
082	0.032	0.05	1.801	0.09	9.054	4.07	0.177	0.21	83.143	25.93	0.036	0.00	2.22	[illegible]
083	0.031	0.02	2.632	0.12	12.070	2.60	0.318	0.23	62.036	3.47	0.053	0.00	0.58	[illegible]
Ar.Mean	0.034	0.03	2.044	0.42	14.014	2.93	0.216	0.14	113.531	44.50	0.052	0.02	3.57	11.91
Std.dev.	0.040	0.05	1.028	0.46	11.630	2.52	0.150	0.20	98.625	71.73	0.030	0.04	5.19	19.10

ARIZONA PUBLIC SERVICE
MONTHLY REPORT for 8-90

DEPOSITION DATA
Comments and Messages Only

Location Number	Sample A Comments	Sample B Comments	Processing Messages
001	VOID/CONTAINER DRY,SCREEN MISSING	VOID/CONTAINER DRY,SCREEN MISSING	MISSING SAMPLE A and B
002			
003			
004			
005		VOID/POSSIBLE CONTAMINATION	MISSING SAMPLE B
006			
007			
008			
009	SCREEN IN CONTAINER	SCREEN IN CONTAINER	
010			
011			
012			
013			
014	VOID/CONTAINER DRY,SCREEN MISSING	BIRD DROPPINGS ON SCREEN	MISSING SAMPLE A
015			
016			
017			
018			
019			
020			
023			
024			
025	SCREEN IN CONTAINER	VOID/DEAD BIRD IN CONTAINER	MISSING SAMPLE B
026	VOID/DEAD BIRD IN CONTAINER		MISSING SAMPLE A
027			
028		VOID/CONTAINER DRY	MISSING SAMPLE B
030			
031	VOID/CONTAINER DRY		MISSING SAMPLE A
032			
033			
034			
035		LIQUID GREEN	
036	CONTAINER ALMOST DRY		
037			
038			
039			
040			
041			
042		SCREEN IN CONTAINER	
043			
044			
045			
080	LIQUID DIRTY		
081			
08[illegible]			
0[illegible]			

ARIZONA PUBLIC SERVICE

MONTHLY REPORT for 9-90

AVERAGE DEPOSITION DATA (Pounds per Acre - 30 Days)
and Differences (d)

Location Number	Na	d	K	d	Ca	d	Mg	d	Cl	d	F	d	SO4	d	NO3	d
001	0.666	0.02	0.299	0.06	1.726	0.47	0.427	0.07	1.278	0.39	0.374	0.07	1.086	0.54	0.372	0.04
002	0.534	0.36	0.178	0.00	1.335	0.18	0.142	0.00	0.801	0.18	0.445	0.00	0.890	0.00	0.312	0.09
003	1.086	0.31	0.630	0.51	2.727	0.14	0.622	0.39	1.450	0.29	0.455	0.02	0.909	0.05	0.125	0.16
004	0.504	0.17	0.203	0.01	1.421	0.08	0.173	0.07	0.305	0.02	0.507	0.03	1.015	0.06	0.171	0.09
005	0.494	0.24	0.196	0.02	1.278	0.30	0.216	0.02	0.435	0.26	0.490	0.04	0.980	0.08	0.049	0.00
006	0.632	0.02	0.159	0.11	0.949	0.24	0.053	0.00	1.225	1.83	0.526	0.02	1.052	0.03	0.242	0.03
007	0.404	0.17	0.201	0.24	2.420	0.62	0.258	0.13	0.363	0.24	0.404	0.00	0.807	0.01	0.267	0.08
008	999.999	999.99	999.999	999.99	999.999	999.99	999.999	999.99	999.999	999.99	999.999	999.99	999.999	999.99	999.999	999.99
009	1.010	999.99	0.337	999.99	2.189	999.99	0.387	999.99	1.179	999.99	0.421	999.99	0.842	999.99	0.269	999.99
010	0.755	0.32	0.240	0.12	2.107	0.56	0.393	0.02	0.738	0.01	0.415	0.08	0.830	0.17	0.308	0.08
011	0.848	0.49	0.424	0.24	4.117	1.59	0.329	0.33	0.719	0.07	0.359	0.04	0.719	0.07	0.120	0.09
012	0.377	0.14	0.534	0.47	2.346	0.08	0.495	0.39	0.227	0.01	0.379	0.01	0.757	0.02	0.038	0.00
013	0.637	0.11	0.734	0.08	3.765	0.60	0.798	0.11	0.492	0.40	0.458	0.05	0.917	0.10	0.046	0.01
014	1.238	0.33	0.267	0.18	3.542	0.08	0.434	0.06	1.240	0.03	0.443	0.01	0.885	0.02	0.044	0.00
015	0.317	0.47	0.267	0.20	1.485	0.03	0.299	0.06	0.263	0.03	0.438	0.04	0.876	0.09	0.044	0.00
016	1.275	0.76	0.323	0.35	2.392	1.50	0.523	0.51	1.325	0.33	0.393	0.04	0.786	0.08	0.088	0.09
017	0.548	0.09	0.576	0.85	1.375	1.41	0.217	0.14	0.446	0.45	0.395	0.05	0.790	0.09	0.039	0.00
018	0.836	0.02	0.335	0.01	2.340	0.28	0.367	0.16	0.754	0.18	0.418	0.01	0.836	0.02	0.042	0.00
019	1.003	0.19	1.367	0.18	6.563	0.76	1.667	0.30	0.911	0.00	0.456	0.00	0.911	0.00	0.155	0.09
020	2.788	0.34	0.542	0.04	2.514	0.54	0.517	0.20	3.243	0.13	0.451	0.03	1.805	0.13	0.207	0.00
[illegible]	0.249	0.17	0.249	0.17	1.074	0.14	0.241	0.16	0.496	0.01	0.414	0.01	0.827	0.02	0.041	0.00
[illegible]	0.454	0.01	0.228	0.16	1.136	0.18	0.281	0.11	0.339	0.22	0.378	0.01	0.757	0.02	0.243	0.07
023	0.742	0.63	1.715	0.45	10.560	3.13	2.354	0.58	0.973	0.18	0.486	0.09	0.973	0.18	0.049	0.01
024	0.534	0.02	0.266	0.17	1.334	0.13	0.230	0.21	0.403	0.28	0.445	0.01	0.890	0.03	0.045	0.00
025	0.290	0.02	0.361	0.13	1.597	0.09	0.386	0.12	0.218	0.01	0.363	0.02	0.726	0.04	0.036	0.00
026	0.853	1.07	0.245	0.14	1.327	0.13	0.156	0.03	0.920	1.32	0.415	0.04	0.829	0.08	0.124	0.16
027	0.818	0.20	0.274	0.19	1.179	0.15	0.181	0.03	0.813	0.52	0.454	0.01	0.908	0.03	0.045	0.00
028	0.392	0.11	0.266	0.36	4.635	3.55	0.335	0.43	0.350	0.19	0.397	0.05	0.793	0.10	0.040	0.00
030	0.615	0.25	0.783	1.40	3.111	0.29	0.583	0.61	0.696	0.09	0.435	0.06	0.870	0.11	0.095	0.11
031	6.274	0.76	0.314	0.35	2.410	0.05	0.746	0.03	3.026	0.44	0.378	0.06	7.456	1.92	0.175	0.27
032	3.168	0.67	0.375	0.38	1.585	0.15	0.271	0.03	3.260	0.86	0.467	0.01	3.732	0.09	0.180	0.27
033	5.053	0.31	0.139	0.01	1.524	0.14	0.233	0.09	2.704	0.38	0.346	0.03	6.203	0.83	0.287	0.15
034	0.518	0.19	0.147	0.01	0.881	0.08	0.150	0.16	0.220	0.02	0.367	0.03	0.735	0.07	0.256	0.02
035	0.252	0.20	0.317	0.28	0.985	0.14	0.257	0.13	0.246	0.03	0.410	0.06	0.821	0.11	0.100	0.05
036	0.403	0.32	0.202	0.16	0.719	0.03	0.193	0.09	0.596	0.21	0.329	0.04	0.657	0.09	0.235	0.02
037	3.291	0.09	0.124	0.09	1.071	0.19	0.157	0.05	3.124	0.25	0.411	0.01	4.937	0.13	0.354	0.03
038	0.344	0.02	0.130	0.09	1.460	0.10	0.180	0.04	0.479	0.45	0.430	0.02	0.860	0.04	0.319	0.07
039	0.339	0.01	0.169	0.01	1.014	0.31	0.186	0.01	0.383	0.27	0.424	0.01	0.847	0.03	0.163	0.24
040	0.277	0.05	0.214	-0.18	1.121	0.49	0.246	0.12	0.613	0.77	0.346	0.07	0.692	0.14	0.035	0.01
041	0.538	0.10	0.155	0.02	1.467	0.01	0.229	0.10	0.619	0.06	0.387	0.04	0.774	0.08	0.317	0.02
042	0.366	0.14	0.147	0.00	0.954	0.12	0.161	0.02	0.401	0.36	0.367	0.01	0.735	0.02	0.183	0.07
043	5.534	1.83	0.708	0.43	1.982	0.33	0.408	0.11	3.191	0.55	0.398	0.03	7.906	2.61	0.279	0.04
044	0.337	0.03	0.505	0.05	1.427	0.04	0.569	0.12	0.373	0.22	0.421	0.04	0.842	0.08	0.042	0.00
045	0.341	0.32	0.696	0.05	9.290	0.49	0.775	0.51	0.387	0.23	0.435	0.03	0.870	0.07	0.146	0.08
080	999.999	999.99	999.999	999.99	999.999	999.99	999.999	999.99	999.999	999.99	999.999	999.99	999.999	999.99	999.999	999.99
081	4.580	0.60	0.490	0.32	3.762	0.61	0.563	0.44	3.191	0.20	0.409	0.00	4.086	1.59	0.041	0.00
[illegible]	1.972	0.33	0.392	0.38	3.236	2.45	0.517	0.71	2.564	0.30	0.494	0.02	0.988	0.03	0.049	0.00
[illegible]	1.537	0.08	0.304	0.18	3.082	0.25	0.402	0.38	2.055	0.17	0.514	0.04	1.027	0.08	0.051	0.00
Ar.Mean	1.218	0.29	0.385	0.22	2.402	0.52	0.420	0.19	1.088	0.30	0.421	0.03	1.509	0.23	0.149	0.06
Std.Dev.	1.482	0.34	0.307	0.25	2.004	0.79	0.394	0.19	0.987	0.34	0.046	0.02	1.757	0.52	0.108	0.07

A R I Z O N A   P U B L I C   S E R V I C E

MONTHLY REPORT for 9-90

AVERAGE DEPOSITION DATA (Pounds per Acre - 30 Days)
and Differences (d)

Location Number	PO4	d	CO3	d	HCO3	d	NH3	d	TSS	d	CU	d	Av d	SD(d)
001	0.048	0.07	3.738	0.70	3.738	0.70	0.217	0.11	42.915	17.14	0.075	0.01	1.46	4.52
002	0.018	0.00	4.452	0.00	4.452	0.00	0.178	0.00	33.832	32.05	0.089	0.00	2.35	8.55
003	0.018	0.00	4.545	0.23	4.545	0.23	0.182	0.01	77.409	57.91	0.091	0.00	4.30	15.43
004	0.020	0.00	5.075	0.30	5.075	0.30	0.203	0.01	46.630	1.30	0.102	0.01	0.18	0.34
005	0.020	0.00	4.899	0.41	4.899	0.41	0.196	0.02	42.948	4.22	0.098	0.01	0.43	1.10
006	0.021	0.00	5.262	0.17	5.262	0.17	0.210	0.01	25.470	26.10	0.105	0.00	2.05	6.94
007	0.016	0.00	4.037	0.04	4.037	0.04	0.161	0.00	29.779	33.58	0.081	0.00	2.51	8.94
008	999.999	999.99	999.999	999.99	999.999	999.99	999.999	999.99	999.999	999.99	999.999	999.99	999.99	999.99
009	0.034	999.99	4.210	999.99	4.210	999.99	0.168	999.99	26.942	999.99	0.084	999.99	999.99	999.99
010	0.017	0.00	4.149	0.85	4.149	0.85	0.166	0.03	44.777	23.71	0.083	0.02	1.92	6.28
011	0.044	0.03	3.593	0.36	13.544	2.93	0.144	0.01	21.876	13.56	0.072	0.01	1.42	3.59
012	0.015	0.00	3.786	0.12	3.786	0.12	0.151	0.00	71.158	0.75	0.076	0.00	0.15	0.23
013	0.018	0.00	4.585	0.51	9.907	11.15	0.183	0.02	50.739	16.32	0.092	0.01	2.11	5.03
014	0.018	0.00	4.427	0.10	14.168	0.31	0.177	0.00	39.116	29.19	0.089	0.00	2.16	7.78
015	0.165	0.30	4.379	0.44	4.379	0.44	0.175	0.02	47.032	5.81	0.088	0.01	0.57	1.52
016	0.016	0.00	3.932	0.41	3.932	0.41	0.157	0.02	49.164	20.80	0.079	0.01	1.81	5.48
017	0.041	0.05	3.949	0.47	3.949	0.47	0.409	0.52	19.327	14.87	0.079	0.01	1.39	3.90
018	0.017	0.00	4.182	0.09	4.182	0.09	0.167	0.00	33.491	7.42	0.084	0.00	0.59	1.97
019	0.128	0.00	4.557	0.02	22.782	1.71	0.365	0.00	109.336	21.33	0.091	0.00	1.76	5.65
020	0.018	0.00	4.513	0.33	4.513	0.33	0.181	0.01	29.140	16.52	0.090	0.01	1.33	[illegible]
021	0.017	0.00	4.136	0.11	4.136	0.11	0.165	0.00	8.746	9.33	0.083	0.00	0.73	[illegible]
022	0.015	0.00	3.783	0.11	3.783	0.11	0.151	0.00	30.353	12.99	0.076	0.00	1.00	[illegible]
023	0.108	0.04	4.864	0.91	18.532	26.43	0.195	0.04	161.909	43.02	0.097	0.02	5.41	12.86
024	0.018	0.00	4.452	0.15	9.430	10.10	0.178	0.01	24.757	20.55	0.089	0.00	2.26	5.90
025	0.015	0.00	3.629	0.19	7.727	8.39	0.145	0.01	42.135	5.15	0.073	0.00	1.01	2.52
026	0.017	0.00	4.147	0.40	4.147	0.40	0.166	0.02	4.147	0.40	0.083	0.01	0.30	0.41
027	0.018	0.00	4.538	0.13	4.538	0.13	0.182	0.01	35.305	11.73	0.091	0.00	0.94	3.11
028	0.016	0.00	3.966	0.48	15.520	22.63	0.159	0.02	36.927	33.49	0.079	0.01	4.39	10.29
030	0.099	0.10	4.352	0.57	13.000	0.04	0.174	0.02	56.391	28.16	0.087	0.01	2.27	7.46
031	0.022	0.01	3.783	0.55	12.106	1.76	0.443	0.24	37.421	35.56	0.076	0.01	3.00	9.39
032	0.019	0.00	4.665	0.11	9.737	10.03	0.187	0.00	50.365	2.54	0.093	0.00	1.08	2.66
033	0.014	0.00	3.463	0.31	3.463	0.31	0.139	0.01	20.471	12.00	0.069	0.01	1.04	3.16
034	0.015	0.00	3.673	0.33	3.673	0.33	0.147	0.01	30.653	6.04	0.073	0.01	0.52	1.59
035	0.016	0.00	4.103	0.57	4.103	0.57	0.317	0.28	20.991	6.86	0.082	0.01	0.66	1.79
036	0.032	0.04	3.287	0.44	3.287	0.44	0.254	0.23	28.394	11.89	0.066	0.01	1.00	3.14
037	0.016	0.00	4.114	0.11	4.114	0.11	0.165	0.00	15.710	11.94	0.082	0.00	0.93	3.17
038	0.017	0.00	4.301	0.22	4.301	0.22	0.260	0.19	31.147	15.35	0.086	0.00	1.20	4.07
039	0.017	0.00	4.235	0.13	4.235	0.13	0.169	0.01	20.382	7.41	0.085	0.00	0.61	1.96
040	0.014	0.00	3.460	0.68	3.460	0.68	0.138	0.03	38.477	2.05	0.069	0:01	0.38	0.56
041	0.015	0.00	3.871	0.38	3.871	0.38	0.236	0.18	39.962	8.49	0.077	0.01	0.70	2.24
042	0.015	0.00	3.673	0.11	3.673	0.11	0.147	0.00	42.406	25.16	0.073	0.00	1.87	6.71
043	0.217	0.30	3.982	0.29	9.739	11.23	1.635	1.95	31.738	4.08	0.080	0.01	1.70	3.00
044	0.017	0.00	4.210	0.39	4.210	0.39	0.168	0.02	48.910	7.86	0.084	0.01	0.66	2.08
045	0.077	0.05	4.352	0.34	27.786	1.30	0.509	0.66	50.827	21.36	0.087	0.01	1.82	5.64
080	999.999	999.99	999.999	999.99	999.999	999.99	999.999	999.99	999.999	999.99	999.999	999.99	999.99	999.99
081	0.016	0.00	4.091	0.05	13.895	4.75	0.164	0.00	62.327	53.05	0.082	0.00	4.40	14.06
082	0.020	0.00	4.938	0.17	10.273	10.50	0.198	0.01	62.990	21.46	0.099	0.00	2.60	[illegible]
083	0.021	0.00	5.137	0.42	5.137	0.42	0.206	0.02	61.480	3.12	0.103	0.01	0.37	[illegible]
Ar.Mean	0.035	0.02	4.206	0.32	7.334	2.95	0.234	0.11	42.096	16.97	0.084	0.01	1.59	4.72
Std.dev.	0.043	0.06	0.463	0.22	5.541	5.83	0.226	0.31	25.990	13.56	0.009	0.00	1.21	3.63

DEPOSITION DATA
Comments and Messages Only

Location Number	Sample A Comments	Sample B Comments	Processing Messages
001			
002			
003			
004			
005			
006			
007			
008	VOID/CONTAINER EMPTY	VOID/CONTAINER EMPTY	MISSING SAMPLE A and B
009		VOID/DEAD BIRD IN CONTAINER	MISSING SAMPLE B
010			
011			
012			
013			
014			
015			
016			
017			
018			
019			
020			
[illegible]			
[illegible]			
023			
024			
025			
026			
027			
028			
030			
031			
032			
033			
034			
035			
036			
037			
038			
039			
040			
041			
042			
043			
044			
045			
080	VOID/CONTAINER EMPTY	VOID/CONTAINER EMPTY	MISSING SAMPLE A and B
081			
08[illegible]			
[illegible]			

ARIZONA PUBLIC SERVICE
MONTHLY REPORT for 10-90

AVERAGE DEPOSITION DATA (Pounds per Acre - 30 Days)
and Differences (d)

Location Number	Na	d	K	d	Ca	d	Mg	d	Cl	d	F	d	SO4	d	NO3	d
001	0.305	0.01	0.153	0.01	0.683	0.43	0.114	0.04	0.229	0.01	0.381	0.01	0.763	0.03	0.057	0.04
002	0.292	0.03	0.146	0.01	0.861	0.50	0.115	0.08	0.219	0.02	0.365	0.04	0.729	0.07	0.036	0.00
003	0.455	0.09	0.152	0.03	1.099	0.53	0.173	0.15	0.330	0.16	0.379	0.08	0.758	0.15	0.038	0.01
004	0.238	999.99	0.238	999.99	1.072	999.99	0.238	999.99	0.179	999.99	0.298	999.99	0.596	999.99	0.030	999.99
005	0.374	0.22	0.253	0.02	0.886	0.08	0.259	0.01	0.341	0.29	0.317	0.03	0.633	0.06	0.032	0.00
006	0.250	0.03	0.125	0.01	0.690	0.21	0.112	0.01	0.275	0.15	0.312	0.04	0.624	0.07	0.069	0.07
007	0.251	0.18	0.166	0.01	0.497	0.04	0.041	0.00	0.248	0.02	0.414	0.03	0.828	0.06	0.041	0.00
008	0.264	0.18	0.175	0.01	0.699	0.03	0.184	0.06	0.262	0.01	0.437	0.02	0.873	0.03	0.044	0.00
009	0.338	0.07	0.169	0.04	0.921	0.03	0.158	0.02	0.254	0.05	0.423	0.09	0.846	0.18	0.042	0.01
010	0.280	0.03	0.214	0.16	0.775	0.23	0.392	0.55	0.210	0.02	0.350	0.04	0.701	0.08	0.035	0.00
011	0.315	0.08	0.315	0.08	1.438	0.68	0.488	0.23	0.370	0.33	0.394	0.10	0.788	0.20	0.039	0.01
012	0.153	0.01	0.153	0.01	0.612	0.06	0.090	0.11	0.230	0.02	0.383	0.04	0.766	0.07	0.038	0.00
013	0.185	0.02	0.274	0.16	0.919	0.30	0.391	0.32	0.278	0.02	0.463	0.04	0.927	0.08	0.046	0.00
014	0.386	0.19	0.153	0.01	1.057	0.51	0.136	0.05	0.339	0.20	0.383	0.04	0.766	0.07	0.038	0.00
015	0.162	0.02	0.162	0.02	0.648	0.07	0.097	0.01	0.243	0.03	0.405	0.04	0.809	0.09	0.040	0.00
016	0.597	0.01	0.134	0.03	0.672	0.16	0.119	0.00	0.538	0.12	0.336	0.08	0.672	0.16	0.054	0.03
017	0.363	0.10	0.147	0.02	0.441	0.06	0.109	0.14	0.220	0.03	0.367	0.05	0.734	0.09	0.037	0.00
018	1.003	0.28	0.158	0.03	0.545	0.05	0.039	0.01	1.003	0.28	0.394	0.07	0.789	0.15	0.039	0.01
019	1.278	0.26	0.184	0.02	1.102	0.09	0.220	0.02	1.373	0.07	0.459	0.04	0.918	0.08	0.046	0.00
020	3.614	0.55	0.265	0.03	1.051	0.16	0.159	0.04	3.064	1.40	0.331	0.03	3.273	0.98	0.074	0.08
[illegible]	0.239	0.17	0.120	0.08	0.476	0.02	0.040	0.00	0.238	0.01	0.396	0.02	0.793	0.03	0.040	0.00
[illegible]	0.232	0.14	0.116	0.07	0.546	0.11	0.078	0.01	0.235	0.02	0.392	0.03	0.785	0.07	0.073	0.06
023	1.199	0.25	1.662	0.46	5.892	0.33	2.857	0.34	0.826	0.14	0.460	0.03	0.921	0.05	0.046	0.00
024	0.154	0.01	0.154	0.01	0.690	0.13	0.115	0.01	0.230	0.01	0.384	0.01	0.768	0.03	0.081	0.09
025	0.150	0.00	0.150	0.00	0.675	0.15	0.120	0.03	0.225	0.00	0.375	0.00	0.750	0.00	0.038	0.00
026	0.433	0.18	0.173	0.00	0.433	0.18	0.043	0.00	0.260	0.00	0.433	0.01	0.865	0.02	0.043	0.00
027	0.330	0.11	0.133	0.01	0.531	0.04	0.093	0.01	0.199	0.01	0.332	0.02	0.664	0.05	0.056	0.04
028	0.340	0.01	0.170	0.00	6.143	6.23	0.349	0.23	0.255	0.00	0.425	0.01	0.849	0.02	0.072	0.06
030	0.996	0.31	1.187	0.69	6.396	0.99	1.693	0.32	1.164	0.03	0.450	0.06	1.378	1.07	0.107	0.13
031	0.229	0.15	0.153	0.00	0.613	0.02	0.057	0.04	0.230	0.01	0.383	0.01	0.766	0.02	0.038	0.00
032	0.320	0.26	0.772	1.17	1.147	0.42	0.114	0.13	0.310	0.06	0.517	0.10	1.034	0.19	0.052	0.01
033	0.234	0.14	0.117	0.07	0.778	0.56	0.089	0.09	0.238	0.02	0.396	0.04	0.793	0.07	0.040	0.00
034	0.228	0.19	0.074	0.01	0.442	0.08	0.037	0.01	0.221	0.04	0.368	0.07	0.737	0.13	0.037	0.01
035	0.183	0.01	0.136	0.09	0.554	0.39	0.046	0.00	0.275	0.01	0.458	0.02	0.916	0.04	0.046	0.00
036	0.299	0.30	0.074	0.00	0.298	0.00	0.037	0.00	0.223	0.00	0.372	0.01	0.745	0.01	0.037	0.00
037	0.163	0.02	0.082	0.01	0.404	0.12	0.041	0.00	0.245	0.02	0.408	0.04	0.817	0.08	0.041	0.00
038	0.146	0.01	0.108	0.07	0.729	0.04	0.172	0.16	0.219	0.01	0.364	0.02	0.729	0.04	0.054	0.03
039	0.164	0.04	0.164	0.04	0.402	0.08	0.059	0.03	0.247	0.05	0.411	0.09	0.822	0.18	0.041	0.01
040	0.171	0.02	0.252	0.14	0.695	0.42	0.173	0.09	0.257	0.03	0.428	0.05	0.856	0.10	0.043	0.00
041	0.226	0.14	0.152	0.01	0.606	0.03	0.098	0.04	0.227	0.01	0.379	0.02	0.758	0.04	0.038	0.00
042	0.171	0.03	0.171	0.03	0.421	0.09	0.070	0.05	0.257	0.05	0.429	0.08	0.857	0.16	0.043	0.01
043	0.176	0.00	0.176	0.00	0.879	0.01	0.141	0.04	0.264	0.00	0.439	0.01	0.879	0.01	0.044	0.00
044	0.118	0.07	0.161	0.02	0.634	0.24	0.150	0.06	0.241	0.03	0.402	0.05	0.804	0.10	0.040	0.00
045	0.390	0.12	0.158	0.01	1.020	0.06	0.155	0.11	0.349	0.20	0.394	0.04	0.788	0.07	0.039	0.00
080	1.290	0.04	0.255	0.18	8.098	0.49	1.024	0.22	1.347	0.08	0.349	0.12	0.986	0.34	0.035	0.01
081	1.303	0.09	0.145	0.01	1.084	0.07	0.167	0.06	1.593	0.11	0.362	0.03	0.724	0.05	0.036	0.00
08[illegible]	2.363	0.07	0.136	0.02	0.941	0.14	0.115	0.00	2.645	0.24	0.340	0.05	2.718	0.39	0.034	0.00
[illegible]	1.341	0.23	0.141	0.01	0.914	0.08	0.161	0.06	1.550	0.10	0.352	0.02	1.409	0.09	0.155	0.02
Ar.Mean	0.514	0.12	0.230	0.08	1.231	0.33	0.249	0.08	0.516	0.10	0.391	0.04	0.910	0.13	0.048	0.02
Std.Dev.	0.641	0.11	0.276	0.20	1.683	0.90	0.472	0.11	0.621	0.21	0.045	0.03	0.468	0.21	0.021	0.03

ARIZONA PUBLIC SERVICE

MONTHLY REPORT for 10-90

AVERAGE DEPOSITION DATA (Pounds per Acre - 30 Days)

and Differences (d)

Location Number	PO4	d	CO3	d	HCO3	d	NH3	d	TSS	d	CU	d	Av d	SD(d)
001	0.015	0.00	3.815	0.13	3.815	0.13	0.228	0.14	13.190	18.62	0.076	0.00	1.40	4.96
002	0.015	0.00	3.647	0.36	3.647	0.36	0.146	0.01	16.448	11.46	0.073	0.01	0.93	3.04
003	0.015	0.00	3.789	0.75	3.789	0.75	0.152	0.03	28.893	37.80	0.076	0.02	2.90	10.05
004	0.012	999.99	2.978	999.99	2.978	999.99	0.119	999.99	39.309	999.99	0.060	999.99	999.99	999.99
005	0.013	0.00	3.165	0.29	3.165	0.29	0.127	0.01	38.475	2.83	0.063	0.01	0.30	0.74
006	0.036	0.05	3.121	0.37	5.762	4.91	0.793	0.53	21.600	15.04	0.062	0.01	1.54	4.09
007	0.025	0.01	4.138	0.29	4.138	0.29	0.166	0.01	14.100	2.66	0.083	0.01	0.26	0.70
008	0.017	0.00	4.366	0.16	4.366	0.16	0.175	0.01	18.354	2.42	0.087	0.00	0.22	0.64
009	0.017	0.00	4.228	0.91	4.228	0.91	0.169	0.04	25.552	8.81	0.085	0.02	0.80	2.33
010	0.110	0.19	3.504	0.39	3.504	0.39	0.214	0.16	38.348	47.57	0.070	0.01	3.56	12.67
011	0.032	0.01	3.938	1.02	3.938	1.02	0.158	0.04	38.818	25.52	0.079	0.02	2.10	6.75
012	0.079	0.13	3.828	0.36	3.828	0.36	0.153	0.01	13.267	11.95	0.077	0.01	0.94	3.17
013	0.104	0.10	4.634	0.38	4.634	0.38	0.571	0.79	31.950	21.47	0.093	0.01	1.72	5.69
014	0.015	0.00	3.828	0.36	3.828	0.36	0.153	0.01	10.790	4.08	0.077	0.01	0.42	1.06
015	0.016	0.00	4.047	0.44	4.047	0.44	0.162	0.02	7.492	6.45	0.081	0.01	0.55	1.71
016	0.013	0.00	3.362	0.78	3.362	0.78	0.134	0.03	18.931	16.86	0.067	0.02	1.36	4.47
017	0.042	0.05	3.672	0.47	3.672	0.47	0.147	0.02	15.693	12.64	0.073	0.01	1.01	3.35
018	0.016	0.00	3.944	0.75	3.944	0.75	0.158	0.03	5.728	2.82	0.079	0.02	0.37	0.75
019	0.018	0.00	4.591	0.39	4.591	0.39	0.184	0.02	21.647	16.50	0.092	0.01	1.28	4.38
020	0.013	0.00	3.307	0.34	3.307	0.34	0.132	0.01	16.923	8.81	0.066	0.01	0.91	[illegible]
021	0.016	0.00	3.964	0.16	3.964	0.16	0.159	0.01	3.964	0.16	0.079	0.00	0.06	[illegible]
022	0.016	0.00	3.924	0.35	3.924	0.35	0.157	0.01	8.668	2.34	0.078	0.01	0.25	0.61
023	0.189	0.34	4.603	0.26	24.936	6.92	0.941	1.52	167.136	44.35	0.092	0.01	3.93	11.77
024	0.015	0.00	3.841	0.13	3.841	0.13	0.154	0.01	6.574	5.60	0.077	0.00	0.44	1.49
025	0.030	0.03	3.750	0.00	3.750	0.00	0.150	0.00	7.125	6.75	0.075	0.00	0.50	1.80
026	0.026	0.02	4.326	0.08	4.326	0.08	0.173	0.00	6.509	4.45	0.087	0.00	0.36	1.18
027	0.026	0.02	3.320	0.24	3.320	0.24	0.133	0.01	8.704	4.61	0.066	0.00	0.39	1.22
028	0.068	0.10	4.246	0.08	20.459	17.37	0.170	0.00	31.570	32.86	0.085	0.00	4.07	9.56
030	0.493	0.58	4.500	0.57	31.169	21.87	0.180	0.02	115.360	8.72	0.090	0.01	2.53	6.00
031	0.046	0.03	3.830	0.11	3.830	0.11	0.460	0.01	3.830	0.11	0.077	0.00	0.04	0.05
032	0.077	0.12	5.170	0.96	5.170	0.96	0.301	0.15	10.326	9.35	0.103	0.02	0.99	2.44
033	0.016	0.00	3.964	0.37	3.964	0.37	0.159	0.01	10.270	0.61	0.079	0.01	0.17	0.22
034	0.015	0.00	3.683	0.67	3.683	0.67	0.147	0.03	8.705	9.38	0.074	0.01	0.81	2.48
035	0.045	0.05	4.580	0.21	4.580	0.21	0.273	0.17	4.580	0.21	0.092	0.00	0.10	0.12
036	0.022	0.02	3.723	0.05	3.723	0.05	0.149	0.00	9.348	11.30	0.074	0.00	0.84	3.01
037	0.051	0.07	4.085	0.40	4.085	0.40	0.163	0.02	4.085	0.40	0.082	0.01	0.11	0.16
038	0.029	0.03	3.643	0.21	3.643	0.21	0.146	0.01	18.150	3.30	0.073	0.00	0.30	0.87
039	0.016	0.00	4.112	0.88	4.112	0.88	0.164	0.04	8.882	8.66	0.082	0.02	0.78	2.29
040	0.101	0.06	4.280	0.49	7.911	6.77	0.413	0.46	20.840	12.63	0.086	0.01	1.52	3.66
041	0.015	0.00	3.790	0.19	3.790	0.19	0.152	0.01	10.074	12.38	0.076	0.00	0.93	3.30
042	0.025	0.01	4.286	0.80	4.286	0.80	0.171	0.03	4.286	0.80	0.086	0.02	0.21	0.32
043	0.044	0.05	4.393	0.05	4.393	0.05	0.176	0.00	17.518	17.36	0.088	0.00	1.26	4.63
044	0.072	0.01	4.022	0.49	4.022	0.49	0.236	0.13	12.967	4.79	0.080	0.01	0.46	1.26
045	0.016	0.00	3.938	0.38	7.313	6.38	0.158	0.01	13.500	6.00	0.079	0.01	0.96	2.22
080	0.014	0.00	3.489	1.20	26.705	4.32	0.140	0.05	54.518	12.05	0.070	0.02	1.37	3.28
081	0.014	0.00	3.621	0.26	3.621	0.26	0.145	0.01	26.483	25.03	0.072	0.01	1.86	[illegible]
082	0.014	0.00	3.397	0.49	3.397	0.49	0.136	0.02	12.666	4.95	0.068	0.01	0.49	[illegible]
083	0.014	0.00	3.523	0.23	3.523	0.23	0.141	0.01	14.682	6.09	0.070	0.00	0.51	[illegible]
Ar.Mean	0.045	0.05	3.915	0.41	5.916	1.80	0.214	0.10	22.017	11.27	0.078	0.01	1.04	3.12
Std.dev.	0.075	0.10	0.447	0.28	6.230	4.21	0.163	0.26	28.084	11.22	0.009	0.01	0.98	3.04

DEPOSITION DATA
Comments and Messages Only

Location Number	Sample A Comments	Sample B Comments	Processing Messages
001			
002			
003			
004		VOID/DEAD BIRD IN CONTAINER	MISSING SAMPLE B
005			
006			
007			
008			
009			
010			
011			
012			
013			
014			
015			
016			
017			
018			
019			
020			
[illegible]			
0[illegible]			
023			
024			
025			
026			
027			
028			
030			
031			
032			
033			
034			
035			
036			
037			
038			
039			
040			
041			
042			
043			
044			
045			
080			
081			
08[illegible]			
0[illegible]			

ARIZONA PUBLIC SERVICE

MONTHLY REPORT for 11-90

AVERAGE DEPOSITION DATA (Pounds per Acre - 30 Days)

and Differences (d)

Location Number	Na	d	K	d	Ca	d	Mg	d	Cl	d	F	d	SO4	d	NO3	d
001	0.401	0.09	0.134	0.03	0.653	0.12	0.131	0.02	0.200	0.04	0.334	0.07	0.668	0.15	0.033	0.01
002	0.290	0.27	0.148	0.01	0.590	0.04	0.110	0.01	0.336	0.25	0.369	0.03	0.738	0.05	0.056	0.04
003	0.680	0.28	0.299	0.06	1.331	0.03	0.375	0.19	0.650	0.31	0.374	0.08	0.748	0.15	0.037	0.01
004	0.485	0.34	0.297	0.28	1.169	0.14	0.202	0.07	0.700	0.93	0.288	0.21	1.120	0.67	0.092	0.11
005	0.438	0.02	0.217	0.14	0.584	0.03	0.159	0.14	0.405	0.38	0.365	0.02	0.730	0.03	0.036	0.00
006	0.575	999.99	0.287	999.99	0.718	999.99	0.158	999.99	0.431	999.99	0.359	999.99	0.718	999.99	0.036	999.99
007	0.234	0.16	0.234	0.16	0.855	0.18	0.093	0.03	0.233	0.01	0.388	0.01	0.777	0.02	0.039	0.00
008	0.417	0.35	0.135	0.03	0.747	0.28	0.143	0.07	0.202	0.04	0.336	0.07	0.673	0.14	0.034	0.01
009	0.486	0.08	0.236	0.12	1.445	0.07	0.479	0.08	0.375	0.31	0.405	0.07	0.810	0.14	0.041	0.01
010	0.636	0.33	0.159	0.00	0.873	0.17	0.190	0.03	0.238	0.00	0.397	0.00	0.794	0.01	0.040	0.00
011	0.274	0.09	0.111	0.01	0.827	0.04	0.144	0.01	0.245	0.14	0.277	0.02	0.553	0.05	0.062	0.07
012	0.276	0.00	0.207	0.14	1.105	0.27	0.256	0.07	0.207	0.00	0.345	0.00	0.691	0.00	0.035	0.00
013	2.166	999.99	0.591	999.99	2.559	999.99	0.748	999.99	0.295	999.99	0.492	999.99	0.984	999.99	0.049	999.99
014	0.608	0.27	0.153	0.01	1.223	0.06	0.221	0.03	0.416	0.36	0.382	0.02	0.765	0.04	0.038	0.00
015	0.423	0.54	0.163	0.02	1.152	0.47	0.274	0.18	0.375	0.29	0.408	0.05	0.815	0.10	0.041	0.01
016	0.492	0.02	0.110	0.02	0.552	0.10	0.128	0.04	0.381	0.04	0.276	0.05	0.552	0.10	0.028	0.01
017	0.318	0.12	0.106	0.04	0.403	0.05	0.121	0.07	0.159	0.06	0.265	0.10	0.530	0.20	0.026	0.01
018	0.557	0.08	0.126	0.05	0.431	0.03	0.094	0.02	0.528	0.43	0.316	0.11	0.632	0.23	0.050	0.02
019	0.845	0.20	0.381	0.13	1.304	0.22	0.392	0.10	0.766	0.04	0.383	0.02	0.766	0.04	0.038	0.00
020	1.582	0.23	0.262	0.07	0.475	0.05	0.162	0.05	1.601	0.41	0.266	0.03	1.562	0.86	0.059	0.06
[illegible]	0.329	0.07	0.134	0.02	0.671	0.12	0.163	0.08	0.201	0.04	0.335	0.06	0.671	0.12	0.034	0.01
[illegible]	0.261	0.02	0.198	0.14	0.653	0.04	0.185	0.12	0.196	0.01	0.326	0.02	0.653	0.04	0.033	0.00
023	1.003	0.14	2.065	0.17	9.299	1.38	4.727	0.38	0.395	0.44	0.338	0.09	0.675	0.19	0.125	0.01
024	0.109	0.06	0.148	0.02	0.890	0.12	0.089	0.10	0.222	0.03	0.371	0.05	0.742	0.10	0.037	0.01
025	0.277	0.06	0.201	0.10	0.679	0.13	0.198	0.15	0.208	0.04	0.347	0.07	0.693	0.14	0.035	0.01
026	0.279	0.02	0.140	0.01	0.559	0.03	0.105	0.05	0.209	0.01	0.349	0.02	0.698	0.04	0.035	0.00
027	0.354	0.03	0.118	0.01	0.652	0.18	0.149	0.10	0.177	0.02	0.295	0.03	0.590	0.06	0.029	0.00
028	0.417	999.99	0.278	999.99	1.252	999.99	0.389	999.99	0.209	999.99	0.348	999.99	0.695	999.99	0.035	999.99
030	0.862	999.99	0.431	999.99	2.585	999.99	0.373	999.99	0.431	999.99	0.359	999.99	0.718	999.99	0.036	999.99
031	0.428	0.09	0.143	0.03	0.712	0.15	0.160	0.09	0.214	0.04	0.356	0.07	0.712	0.15	0.036	0.01
032	0.775	0.05	0.709	0.46	1.485	0.41	0.355	0.18	0.261	0.04	0.435	0.07	0.869	0.14	0.043	0.01
033	0.327	0.11	0.195	0.12	0.789	0.04	0.307	0.13	0.197	0.01	0.329	0.02	0.657	0.04	0.033	0.00
034	0.210	0.15	0.139	0.01	0.488	0.17	0.045	0.02	0.208	0.01	0.347	0.02	0.694	0.04	0.035	0.00
035	0.187	999.99	0.187	999.99	0.934	999.99	0.187	999.99	0.280	999.99	0.467	999.99	0.934	999.99	0.047	999.99
036	0.280	0.27	0.210	0.13	0.562	0.26	0.134	0.07	0.212	0.01	0.353	0.01	0.706	0.03	0.035	0.00
037	0.388	0.15	0.155	0.00	0.621	0.01	0.101	0.01	0.233	0.00	0.388	0.01	0.777	0.01	0.039	0.00
038	0.133	0.04	0.133	0.04	0.855	0.14	0.053	0.03	0.200	0.06	0.333	0.11	0.666	0.21	0.033	0.01
039	0.201	0.13	0.135	0.00	0.675	0.02	0.095	0.06	0.202	0.01	0.337	0.01	0.675	0.02	0.034	0.00
040	0.338	0.39	0.556	0.05	0.983	0.51	0.686	0.01	0.242	0.05	0.403	0.08	0.806	0.16	0.040	0.01
041	0.444	0.30	0.148	0.00	0.814	0.15	0.133	0.03	0.407	0.37	0.370	0.00	0.740	0.00	0.070	0.07
042	0.262	0.06	0.131	0.03	0.655	0.15	0.180	0.01	0.196	0.04	0.327	0.07	0.655	0.15	0.073	0.09
043	0.347	0.08	0.141	0.02	0.912	0.01	0.130	0.08	0.309	0.16	0.353	0.06	0.706	0.12	0.035	0.01
044	0.296	0.00	0.370	0.15	0.888	0.00	0.281	0.00	0.222	0.00	0.370	0.00	0.740	0.00	0.037	0.00
045	0.536	0.01	0.202	0.14	1.006	0.15	0.302	0.15	0.367	0.33	0.335	0.01	0.670	0.01	0.034	0.00
080	0.972	0.33	0.294	0.26	4.262	1.42	0.901	0.64	0.830	0.04	0.379	0.05	0.759	0.10	0.038	0.00
081	1.458	0.60	0.231	0.04	0.755	0.25	0.139	0.02	1.085	1.42	0.289	0.05	0.841	0.43	0.053	0.04
082	1.611	0.06	0.405	0.34	1.291	0.00	0.269	0.05	1.728	0.30	0.326	0.07	0.945	0.45	0.100	0.06
0[illegible]	1.598	0.01	0.295	0.01	1.008	0.02	0.372	0.07	1.522	0.45	0.307	0.11	0.862	0.27	0.083	0.09
Ar.Mean	0.560	0.16	0.268	0.08	1.165	0.19	0.329	0.09	0.415	0.19	0.352	0.05	0.754	0.14	0.045	0.02
Std.Dev.	0.445	0.15	0.296	0.10	1.365	0.30	0.672	0.11	0.368	0.27	0.047	0.04	0.162	0.17	0.020	0.03

A R I Z O N A   P U B L I C   S E R V I C E

MONTHLY REPORT for 11-90

AVERAGE DEPOSITION DATA (Pounds per Acre - 30 Days)
and Differences (d)

Location Number	PO4	d	CO3	d	HCO3	d	NH3	d	TSS	d	CU	d	Av d	SD(d)
001	0.013	0.00	3.339	0.73	3.339	0.73	0.134	0.03	10.394	3.02	0.067	0.01	0.36	0.80
002	0.015	0.00	3.690	0.27	3.690	0.27	0.148	0.01	5.468	3.29	0.074	0.01	0.32	0.86
003	0.015	0.00	3.739	0.75	6.093	3.96	0.150	0.03	28.636	4.62	0.116	0.10	0.75	1.52
004	0.034	0.00	2.875	2.11	9.082	0.71	0.268	0.22	15.677	9.54	0.057	0.04	1.10	2.49
005	0.015	0.00	3.648	0.16	3.648	0.16	0.146	0.01	15.423	23.39	0.073	0.00	1.75	6.23
006	0.014	999.99	3.591	999.99	3.591	999.99	0.345	999.99	12.927	999.99	0.072	999.99	999.99	999.99
007	0.016	0.00	3.883	0.12	6.559	5.23	0.232	0.15	3.883	0.12	0.078	0.00	0.44	1.38
008	0.028	0.03	3.363	0.68	5.955	5.86	0.223	0.20	8.813	3.11	0.067	0.01	0.78	1.67
009	0.024	0.01	4.052	0.70	9.726	1.68	0.162	0.03	33.339	10.32	0.081	0.01	0.97	2.73
010	0.016	0.00	3.968	0.05	3.968	0.05	0.159	0.00	14.294	3.35	0.079	0.00	0.29	0.89
011	0.033	0.00	2.766	0.23	2.766	0.23	0.111	0.01	5.679	5.59	0.055	0.00	0.46	1.48
012	0.021	0.01	3.454	0.01	3.454	0.01	0.138	0.00	23.487	2.85	0.069	0.00	0.24	0.75
013	0.059	999.99	4.922	999.99	11.813	999.99	0.197	999.99	59.063	999.99	0.098	999.99	999.99	999.99
014	0.053	0.01	3.823	0.19	3.823	0.19	0.153	0.01	22.819	8.01	0.076	0.00	0.66	2.12
015	0.025	0.02	4.077	0.51	4.077	0.51	0.163	0.02	29.095	21.49	0.082	0.01	1.73	5.69
016	0.011	0.00	2.761	0.52	2.761	0.52	0.110	0.02	10.441	0.88	0.055	0.01	0.17	0.27
017	0.011	0.00	2.648	1.02	2.648	1.02	0.106	0.04	10.850	9.06	0.053	0.02	0.85	2.39
018	0.013	0.00	3.159	1.14	3.159	1.14	0.126	0.05	4.455	1.45	0.063	0.02	0.34	0.51
019	0.039	0.05	3.830	0.20	6.582	5.71	0.153	0.01	40.032	17.45	0.077	0.00	1.73	4.77
020	0.011	0.00	2.658	0.33	2.658	0.33	0.106	0.01	13.491	8.91	0.053	0.01	0.81	[illegible]
021	0.013	0.00	3.353	0.62	3.353	0.62	0.134	0.02	12.565	12.95	0.067	0.01	1.05	[illegible]
022	0.027	0.03	3.265	0.22	5.627	4.95	0.252	0.25	11.166	4.67	0.065	0.00	0.75	[illegible]
023	0.351	0.10	3.375	0.93	38.173	15.84	0.135	0.04	295.136	55.00	0.068	0.02	5.34	14.88
024	0.015	0.00	3.708	0.52	6.121	4.31	0.148	0.02	3.708	0.52	0.074	0.01	0.42	1.13
025	0.014	0.00	3.466	0.71	3.466	0.71	0.139	0.03	13.241	4.10	0.069	0.01	0.45	1.08
026	0.014	0.00	3.491	0.19	3.491	0.19	0.140	0.01	8.868	10.94	0.070	0.00	0.82	2.91
027	0.012	0.00	2.949	0.28	2.949	0.28	0.118	0.01	15.000	12.04	0.059	0.01	0.93	3.20
028	0.028	999.99	3.477	999.99	8.345	999.99	0.139	999.99	43.118	999.99	0.070	999.99	999.99	999.99
030	0.057	999.99	3.591	999.99	8.618	999.99	0.144	999.99	27.291	999.99	0.072	999.99	999.99	999.99
031	0.014	0.00	3.563	0.73	3.563	0.73	0.143	0.03	11.894	1.80	0.071	0.01	0.28	0.50
032	0.044	0.02	4.346	0.71	7.635	7.28	0.174	0.03	24.146	21.98	0.087	0.01	2.24	5.99
033	0.013	0.00	3.287	0.18	3.287	0.18	0.131	0.01	25.443	13.09	0.066	0.00	0.99	3.48
034	0.014	0.00	3.472	0.22	3.472	0.22	0.139	0.01	8.376	3.30	0.069	0.00	0.30	0.87
035	0.019	999.99	4.669	999.99	4.669	999.99	0.187	999.99	11.206	999.99	0.093	999.99	999.99	999.99
036	0.014	0.00	3.532	0.15	3.532	0.15	0.141	0.01	14.879	4.85	0.071	0.00	0.42	1.28
037	0.016	0.00	3.883	0.07	3.883	0.07	0.155	0.00	5.806	3.77	0.078	0.00	0.29	1.00
038	0.013	0.00	3.330	1.07	3.330	1.07	0.133	0.04	16.277	16.90	0.067	0.02	1.41	4.47
039	0.013	0.00	3.375	0.11	5.777	4.92	0.135	0.00	11.464	0.96	0.068	0.00	0.45	1.31
040	0.060	0.08	4.028	0.80	4.028	0.80	0.234	0.11	69.126	10.51	0.081	0.02	0.97	2.76
041	0.015	0.00	3.702	0.00	3.702	0.00	0.148	0.00	7.033	6.66	0.074	0.00	0.54	1.77
042	0.013	0.00	3.273	0.73	3.273	0.73	0.131	0.03	13.964	4.65	0.065	0.01	0.48	1.23
043	0.047	0.06	3.528	0.58	3.528	0.58	0.141	0.02	7.739	7.84	0.071	0.01	0.69	2.07
044	0.015	0.00	3.702	0.00	6.293	5.18	0.148	0.00	29.613	2.96	0.074	0.00	0.59	1.54
045	0.013	0.00	3.352	0.07	5.723	4.81	0.134	0.00	20.805	4.45	0.067	0.00	0.72	1.66
080	0.045	0.02	3.794	0.49	18.212	2.33	0.152	0.02	27.093	20.09	0.076	0.01	1.84	5.29
081	0.012	0.00	2.886	0.50	2.886	0.50	0.115	0.02	4.205	2.14	0.058	0.01	0.43	0.63
082	0.013	0.00	3.261	0.66	7.827	1.58	0.130	0.03	6.493	7.12	0.065	0.01	0.77	[illegible]
083	0.012	0.00	3.066	1.15	4.811	2.34	0.123	0.05	9.298	11.32	0.061	0.02	1.14	[illegible]
Ar.Mean	0.029	0.01	3.520	0.50	5.812	2.06	0.156	0.04	23.400	8.86	0.071	0.01	0.89	2.51
Std.dev.	0.050	0.02	0.469	0.42	5.565	2.98	0.046	0.06	42.321	9.52	0.011	0.02	0.85	2.48

DEPOSITION DATA
Comments and Messages Only

Location Number	Sample A Comments	Sample B Comments	Processing Messages
001			
002			
003			
004			
005			
006		VOID/CONTAINER ON GROUND	MISSING SAMPLE B
007			
008			
009			
010			
011			
012			
013		VOID/POSSIBLE CONTAMINATION	MISSING SAMPLE B
014			
015			
016			
017			
018			
019			
020			
0[illegible]			
0[illegible]			
023			
024			
025			
026			
027			
028		VOID/DEAD BIRD IN CONTAINER	MISSING SAMPLE B
030		VOID/POSSIBLE CONTAMINATION	MISSING SAMPLE B
031			
032			
033			
034			
035		VOID/VANDALISM	MISSING SAMPLE B
036			
037			
038			
039			
040			
041			
042			
043			
044			
045			
080			
081			
082			
0[illegible]			

AVERAGE DEPOSITION DATA (Pounds per Acre - 30 Days)
and Differences (d)

Location Number	Na	d	K	d	Ca	d	Mg	d	Cl	d	F	d	SO4	d	NO3	d
001	0.664	0.17	0.190	0.00	1.045	0.17	0.133	0.00	0.761	0.02	0.475	0.01	0.951	0.02	0.219	0.01
002	0.769	0.35	0.169	0.04	0.957	0.73	0.179	0.06	0.580	0.03	0.421	0.10	0.843	0.20	0.178	0.06
003	1.520	0.20	0.350	0.23	2.344	0.52	0.398	0.01	1.405	0.03	0.585	0.01	1.171	0.03	0.316	0.02
004	0.807	0.07	0.339	0.17	1.381	0.19	0.161	0.01	0.615	0.46	0.585	0.11	1.169	0.23	0.213	0.09
005	0.986	0.58	0.342	0.34	1.460	0.15	0.276	0.14	0.538	0.31	0.536	0.21	1.072	0.41	0.054	0.02
006	0.866	0.52	0.213	0.02	1.067	0.12	0.181	0.00	0.741	0.13	0.533	0.06	1.067	0.12	0.201	0.04
007	0.511	0.14	0.428	0.47	1.755	0.02	0.198	0.05	0.311	0.04	0.518	0.07	1.036	0.14	0.185	0.02
008	0.487	0.21	0.194	0.01	0.973	0.41	0.165	0.06	0.291	0.01	0.485	0.01	0.971	0.03	0.175	0.04
009	0.592	0.06	0.197	0.02	1.578	0.15	0.225	0.04	0.437	0.25	0.493	0.05	0.986	0.09	0.197	0.02
010	0.484	0.04	0.161	0.01	0.975	0.40	0.161	0.01	0.242	0.02	0.404	0.03	0.807	0.06	0.185	0.00
011	0.630	0.10	0.182	0.02	1.176	0.03	0.201	0.06	0.418	0.32	0.454	0.06	0.909	0.11	0.126	0.16
012	0.503	0.31	0.257	0.19	0.934	0.23	0.144	0.03	0.254	0.02	0.424	0.03	0.847	0.05	0.186	0.01
013	0.803	0.10	0.709	0.29	1.486	0.41	0.569	0.33	0.709	0.29	0.502	0.06	1.004	0.13	0.098	0.10
014	1.394	0.01	0.187	0.02	1.394	0.01	0.166	0.05	1.120	0.14	0.467	0.06	0.933	0.12	0.251	0.01
015	0.378	0.03	0.189	0.02	1.125	0.28	0.113	0.01	0.283	0.02	0.472	0.04	0.944	0.08	0.079	0.06
016	1.661	0.01	0.381	0.35	1.176	0.13	0.202	0.11	1.465	0.04	0.490	0.05	1.444	0.82	0.369	0.08
017	0.647	0.00	0.216	0.00	0.755	0.22	0.119	0.02	0.323	0.00	0.539	0.00	1.078	0.01	0.226	0.02
018	0.999	0.50	0.250	0.00	0.999	0.00	0.094	0.06	0.874	0.25	0.624	0.00	1.248	0.00	0.312	0.02
019	1.148	0.22	0.385	0.27	2.304	0.58	0.590	0.27	1.022	0.03	0.639	0.02	1.278	0.04	0.307	0.01
020	7.340	0.39	0.474	0.06	1.898	0.22	0.271	0.04	7.075	0.59	0.593	0.07	7.117	0.83	0.822	0.19
0[illegible]	0.520	0.23	0.207	0.01	0.828	0.03	0.124	0.00	0.311	0.01	0.518	0.02	1.035	0.04	0.197	0.03
[illegible]	0.308	0.22	0.204	0.01	0.817	0.03	0.133	0.02	0.306	0.01	0.510	0.02	1.021	0.04	0.204	0.03
02[illegible]	1.542	0.18	1.658	0.41	9.370	0.83	2.744	1.04	1.309	0.29	0.594	0.02	1.188	0.04	0.392	0.04
024	0.173	999.99	0.173	999.99	0.865	999.99	0.104	999.99	0.259	999.99	0.432	999.99	0.865	999.99	0.190	999.99
025	0.504	0.06	1.232	0.68	1.243	0.34	0.569	0.24	1.232	0.68	0.420	0.05	0.839	0.11	0.159	0.00
026	0.317	0.20	0.106	0.00	0.851	0.03	0.080	0.06	0.319	0.01	0.532	0.02	1.063	0.04	0.170	0.01
027	0.722	0.09	0.241	0.03	1.075	0.11	0.132	0.01	0.553	0.43	0.601	0.08	1.203	0.15	0.276	0.01
028	0.656	0.47	0.328	0.24	1.417	0.73	0.163	0.07	0.325	0.02	0.541	0.03	1.083	0.06	0.208	0.16
030	0.824	0.23	0.706	0.47	4.121	0.25	0.800	0.37	1.060	0.24	0.589	0.00	1.177	0.01	0.283	0.00
031	0.308	0.17	0.210	0.03	1.047	0.14	0.136	0.00	0.314	0.04	0.524	0.07	1.047	0.14	0.210	0.03
032	0.927	0.58	1.079	1.73	1.033	0.36	0.264	0.10	1.010	1.38	0.570	0.07	1.140	0.15	0.094	0.07
033	0.324	0.21	0.217	0.01	0.978	0.25	0.130	0.00	0.325	0.01	0.543	0.02	1.085	0.04	0.113	0.12
034	0.398	0.00	0.149	0.10	0.696	0.19	0.050	0.00	0.299	0.00	0.498	0.00	0.995	0.01	0.169	0.02
035	0.292	0.20	0.146	0.10	0.485	0.19	0.049	0.00	0.291	0.00	0.486	0.00	0.972	0.01	0.049	0.00
036	0.270	0.18	0.180	0.00	0.539	0.00	0.045	0.00	0.269	0.00	0.449	0.00	0.898	0.00	0.162	0.00
037	0.221	0.26	0.089	0.00	0.447	0.19	0.045	0.00	0.267	0.01	0.445	0.01	0.891	0.03	0.076	0.06
038	0.389	0.02	0.147	0.11	0.678	0.16	0.084	0.07	0.292	0.02	0.486	0.03	0.972	0.06	0.185	0.03
039	0.323	0.22	0.107	0.00	0.536	0.21	0.054	0.00	0.322	0.00	0.536	0.01	1.073	0.02	0.193	0.00
040	0.459	0.18	0.184	0.00	0.918	0.00	0.220	0.04	0.275	0.00	0.459	0.00	0.918	0.00	0.101	0.02
041	0.188	0.01	0.188	0.01	1.034	0.16	0.104	0.02	0.282	0.01	0.470	0.01	0.941	0.03	0.207	0.03
042	0.302	0.23	0.198	0.02	0.793	0.08	0.141	0.09	0.297	0.03	0.496	0.05	0.991	0.10	0.188	0.00
043	0.561	0.28	0.222	0.02	1.110	0.11	0.123	0.03	0.333	0.03	0.555	0.06	1.110	0.11	0.188	0.00
044	0.276	0.18	0.184	0.00	0.920	0.00	0.129	0.04	0.276	0.00	0.460	0.00	0.920	0.00	0.175	0.02
045	0.572	0.08	0.191	0.03	2.096	0.28	0.283	0.04	0.438	0.34	0.476	0.06	0.953	0.13	0.184	0.12
080	1.971	0.21	0.263	0.01	4.865	0.13	0.606	0.12	2.234	0.20	0.658	0.02	1.315	0.04	0.228	0.32
081	4.157	0.04	0.416	0.00	1.767	0.23	0.270	0.04	4.055	0.67	0.520	0.01	4.157	0.04	0.592	0.06
082	3.060	0.67	0.254	0.01	1.912	0.35	0.216	0.01	3.693	0.45	0.636	0.03	2.544	0.13	0.547	0.00
0[illegible]	3.513	0.44	0.251	0.00	1.884	0.28	0.252	0.10	3.767	0.07	0.628	0.01	2.511	0.04	0.490	0.02
Ar.Mean	0.985	0.21	0.320	0.14	1.481	0.23	0.262	0.08	0.920	0.17	0.518	0.04	1.287	0.11	0.228	0.05
Std.Dev.	1.249	0.17	0.298	0.29	1.420	0.20	0.401	0.16	1.278	0.26	0.065	0.04	1.021	0.17	0.143	0.06

A R I Z O N A   P U B L I C   S E R V I C E
MONTHLY REPORT for 12-90

AVERAGE DEPOSITION DATA (Pounds per Acre - 30 Days)
and Differences (d)

Location Number	PO4	d	CO3	d	HCO3	d	NH3	d	TSS	d	CU	d	Av d	SD(d)
001	0.019	0.00	4.754	0.11	9.082	8.77	0.190	0.00	4.754	0.11	0.095	0.00	0.67	2.33
002	0.024	0.01	4.213	1.01	4.213	1.01	0.243	0.11	10.513	11.59	0.084	0.02	1.09	3.04
003	0.023	0.00	5.853	0.13	5.853	0.13	0.234	0.01	21.096	5.16	0.117	0.00	0.46	1.36
004	0.108	0.16	5.847	1.14	5.847	1.14	0.551	0.59	5.847	1.14	0.117	0.02	0.39	0.43
005	0.021	0.01	5.361	2.06	5.361	2.06	0.214	0.08	20.211	4.64	0.107	0.04	0.79	1.30
006	0.021	0.00	5.333	0.61	5.333	0.61	0.439	0.48	7.847	4.42	0.107	0.01	0.51	1.15
007	0.195	0.27	5.182	0.68	5.182	0.68	1.285	1.41	5.182	0.68	0.104	0.01	0.33	0.41
008	0.019	0.00	4.853	0.13	4.853	0.13	0.194	0.01	9.280	8.99	0.097	0.00	0.72	2.38
009	0.020	0.00	4.930	0.46	4.930	0.46	0.197	0.02	10.893	2.99	0.099	0.01	0.33	0.78
010	0.016	0.00	4.037	0.31	4.037	0.31	0.161	0.01	6.971	6.18	0.081	0.01	0.53	1.63
011	0.018	0.00	4.544	0.57	4.544	0.57	0.182	0.02	7.926	7.34	0.091	0.01	0.67	1.93
012	0.137	0.11	4.235	0.26	4.235	0.26	0.169	0.01	13.394	9.32	0.085	0.01	0.77	2.46
013	0.103	0.09	5.018	0.64	9.247	7.82	0.628	0.88	36.304	21.36	0.100	0.01	2.32	5.84
014	0.019	0.00	4.665	0.60	4.665	0.60	0.187	0.02	4.665	0.60	0.093	0.01	0.16	0.24
015	0.019	0.00	4.721	0.40	4.721	0.40	0.189	0.02	4.721	0.40	0.094	0.01	0.13	0.16
016	0.177	0.31	4.902	0.54	4.902	0.54	0.567	0.72	9.999	9.66	0.098	0.01	0.95	2.52
017	0.054	0.06	5.388	0.03	5.388	0.03	0.216	0.00	5.388	0.03	0.108	0.00	0.03	0.06
018	0.025	0.00	6.241	0.00	6.241	0.00	0.250	0.00	10.610	8.74	0.125	0.00	0.68	2.32
019	0.026	0.00	6.388	0.19	6.388	0.19	0.256	0.01	41.073	26.75	0.128	0.00	2.04	7.11
020	0.024	0.00	5.931	0.69	5.931	0.69	0.237	0.03	16.467	2.80	0.119	0.01	0.47	[illegible]
021	0.041	0.04	5.177	0.19	5.177	0.19	0.207	0.01	8.734	6.92	0.104	0.00	0.55	[illegible]
022	0.020	0.00	5.105	0.19	5.105	0.19	0.204	0.01	5.105	0.19	0.102	0.00	0.07	0.09
023	0.178	0.02	5.938	0.22	31.995	5.91	0.238	0.01	170.280	69.52	0.119	0.00	5.61	18.46
024	0.017	999.99	4.324	999.99	4.324	999.99	0.173	999.99	4.324	999.99	0.086	999.99	999.99	999.99
025	0.017	0.00	4.197	0.54	4.197	0.54	0.246	0.14	36.390	12.03	0.084	0.01	1.10	3.16
026	0.021	0.00	5.317	0.18	5.317	0.18	0.213	0.01	5.317	0.18	0.106	0.00	0.07	0.08
027	0.024	0.00	6.014	0.75	6.014	0.75	0.241	0.03	6.014	0.75	0.120	0.02	0.23	0.30
028	0.022	0.00	5.413	0.33	5.413	0.33	0.217	0.01	5.413	0.33	0.108	0.01	0.20	0.22
030	0.188	0.19	5.887	0.03	11.198	10.65	0.353	0.23	44.720	23.36	0.118	0.00	2.57	6.60
031	0.077	0.11	5.238	0.68	5.238	0.68	0.210	0.03	5.238	0.68	0.105	0.01	0.20	0.26
032	0.059	0.08	5.700	0.75	5.700	0.75	0.228	0.03	12.465	0.63	0.114	0.02	0.48	0.54
033	0.022	0.00	5.425	0.20	5.425	0.20	0.217	0.01	8.087	5.12	0.109	0.00	0.44	1.35
034	0.020	0.00	4.977	0.05	4.977	0.05	0.199	0.00	4.977	0.05	0.100	0.00	0.03	0.05
035	0.019	0.00	4.858	0.03	4.858	0.03	0.194	0.00	4.858	0.03	0.097	0.00	0.04	0.07
036	0.018	0.00	4.489	0.02	4.489	0.02	0.180	0.00	4.489	0.02	0.090	0.00	0.02	0.05
037	0.018	0.00	4.455	0.14	4.455	0.14	0.178	0.01	4.455	0.14	0.089	0.00	0.07	0.09
038	0.019	0.00	4.863	0.28	4.863	0.28	0.195	0.01	7.225	4.45	0.097	0.01	0.39	1.17
039	0.054	0.07	5.363	0.08	5.363	0.08	0.215	0.00	9.143	7.64	0.107	0.00	0.59	2.03
040	0.018	0.00	4.588	0.00	4.588	0.00	0.184	0.00	16.518	7.34	0.092	0.00	0.54	1.96
041	0.019	0.00	4.705	0.14	4.705	0.14	0.188	0.01	4.705	0.14	0.094	0.00	0.05	0.06
042	0.020	0.00	4.956	0.49	4.956	0.49	0.198	0.02	7.313	4.23	0.099	0.01	0.42	1.11
043	0.069	0.10	5.550	0.55	5.550	0.55	0.222	0.02	5.550	0.55	0.111	0.01	0.17	0.22
044	0.018	0.00	4.599	0.02	4.599	0.02	0.184	0.00	9.199	0.04	0.092	0.00	0.02	0.05
045	0.070	0.10	4.763	0.63	4.763	0.63	0.191	0.03	17.660	10.96	0.095	0.01	0.96	2.89
080	0.026	0.00	6.576	0.18	12.576	12.18	0.263	0.01	23.783	16.43	0.132	0.00	2.13	5.23
081	0.021	0.00	5.196	0.05	5.196	0.05	0.208	0.00	11.427	1.96	0.104	0.00	0.23	0.53
082	0.025	0.00	6.361	0.33	6.361	0.33	0.254	0.01	6.361	0.33	0.127	0.01	0.19	[illegible]
083	0.025	0.00	6.278	0.11	6.278	0.11	0.251	0.00	11.978	11.51	0.126	0.00	0.91	[illegible]
Ar.Mean	0.046	0.04	5.181	0.38	6.138	1.32	0.263	0.11	14.893	6.77	0.104	0.01	0.69	1.91
Std.dev.	0.050	0.07	0.646	0.38	4.162	2.82	0.181	0.27	24.918	11.36	0.013	0.01	0.95	3.02

ARIZONA PUBLIC SERVICE
MONTHLY REPORT for 12-90

DEPOSITION DATA
Comments and Messages Only

Location Number	Sample A Comments	Sample B Comments	Processing Messages
001			
002			
003			
004			
005			
006			
007			
008			
009			
010			
011			
012			
013			
014			
015			
016			
017			
018			
019			
020			
023			
024	VOID/VANDALISM		MISSING SAMPLE A
025			
026			
027			
028			
030			
031			
032			
033			
034			
035			
036			
037			
038			
039			
040			
041			
042			
043			
044			
045			
080			
081			
08[illegible]			

Appendix D

Suspended Particulate Matter Data

Data on suspended particulate matter were collected each month at the following sites: 8, 9, 10, 20, 21, and 27. The data for the 10 ions analyzed are presented for each month in the following tables. Values below the detectable limit of the laboratory procedure are preceded by minus signs. Missing data are represented by a field of "9s."

ARIZONA PUBLIC SERVICE

Suspended Particulate

Monitoring Location		008	009	010	020	021	027
Year		90	90	90	90	90	90
Month		1	1	1	1	1	1
Lab Number		90-01-0008	90-01-0009	90-01-0010	90-01-0020	90-01-0021	90-01-0027
Calcium	(ug/m3)	0.85	1.44	1.12	1.14	0.73	0.90
Chloride	(ug/m3)	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3
Iron	(ug/m3)	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005
Fluoride	(ug/m3)	0.031	0.040	0.033	0.038	0.028	0.031
Potassium	(ug/m3)	-0.30	-0.30	-0.30	-0.30	-0.30	-0.30
Magnesium	(ug/m3)	0.06	0.06	0.05	0.07	0.05	0.06
Sodium	(ug/m3)	0.56	0.54	0.59	0.73	0.59	0.56
Nitrate	(ug/m3)	0.16	0.18	0.19	0.21	0.16	0.20
Sulfate	(ug/m3)	0.7	0.9	0.9	1.2	0.9	0.9
Phosphate	(ug/m3)	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02

A R I Z O N A P U B L I C S E R V I C E

Suspended Particulate

Monitoring Location		008	009	010	020	021	027
Year		90	90	90	90	90	90
Month		2	2	2	2	2	2
Lab Number		90-02-0008	90-02-0009	90-02-0010	90-02-0020	90-02-0021	90-02-0027
Calcium	(ug/m3)	1.40	2.13	1.68	1.71	1.18	1.16
Chloride	(ug/m3)	-0.3	-0.3	-0.3	0.9	-0.3	-0.3
Iron	(ug/m3)	0.006	0.003	0.003	0.006	0.003	0.009
Fluoride	(ug/m3)	0.026	0.038	0.032	0.029	0.026	0.026
Potassium	(ug/m3)	-0.30	-0.30	-0.30	-0.30	-0.30	-0.30
Magnesium	(ug/m3)	0.07	0.08	0.08	0.08	0.06	0.07
Sodium	(ug/m3)	0.55	0.49	0.53	0.74	0.53	0.56
Nitrate	(ug/m3)	0.21	0.24	0.24	0.26	0.20	0.22
Sulfate	(ug/m3)	1.2	1.2	1.2	1.5	0.9	1.7
Phosphate	(ug/m3)	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02

A R I Z O N A   P U B L I C   S E R V I C E

Suspended Particulate

Monitoring Location		008	009	010	020	021	027
Year		90	90	90	90	90	90
Month		3	3	3	3	3	3
Lab Number		90-03-0008	90-03-0009	90-03-0010	90-03-0020	90-03-0021	90-03-0027
Calcium	(ug/m3)	1.55	2.05	1.58	1.70	1.64	1.48
Chloride	(ug/m3)	0.3	0.3	0.3	0.5	0.3	0.3
Iron	(ug/m3)	0.029	0.009	-0.005	0.006	0.006	-0.005
Fluoride	(ug/m3)	0.032	0.050	0.041	0.035	0.035	0.035
Potassium	(ug/m3)	-0.30	-0.30	-0.30	-0.30	-0.30	-0.30
Magnesium	(ug/m3)	0.07	0.10	0.08	0.08	0.07	0.07
Sodium	(ug/m3)	0.51	0.54	0.50	1.53	0.49	0.53
Nitrate	(ug/m3)	0.19	0.26	0.23	0.24	0.19	0.21
Sulfate	(ug/m3)	0.9	1.8	1.5	1.5	2.1	1.5
Phosphate	(ug/m3)	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02

A R I Z O N A   P U B L I C   S E R V I C E

Suspended Particulate

Monitoring Location		008	009	010	020	021	027
Year		90	90	90	90	90	90
Month		4	4	4	4	4	4
Lab Number		90-04-0008	90-04-0009	90-04-0010	90-04-0020	90-04-0021	90-04-0027
Calcium	(ug/m3)	1.17	2.06	1.65	1.35	1.66	1.37
Chloride	(ug/m3)	0.3	0.3	0.3	0.4	0.3	0.3
Iron	(ug/m3)	0.021	0.021	0.021	0.021	0.021	0.021
Fluoride	(ug/m3)	0.029	0.038	0.038	0.032	0.035	0.035
Potassium	(ug/m3)	-0.30	-0.30	-0.30	-0.30	-0.30	-0.30
Magnesium	(ug/m3)	0.08	0.09	0.11	0.09	0.08	0.08
Sodium	(ug/m3)	0.97	0.62	0.68	0.79	0.65	0.68
Nitrate	(ug/m3)	0.17	0.20	0.21	0.20	0.18	0.19
Sulfate	(ug/m3)	1.5	1.5	0.9	1.5	1.2	1.2
Phosphate	(ug/m3)	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02

A R I Z O N A   P U B L I C   S E R V I C E

Suspended Particulate

Monitoring Location		008	009	010	020	021	027
Year		90	90	90	90	90	90
Month		5	5	5	5	5	5
Lab Number		90-05-0008	90-05-0009	90-05-0010	90-05-0020	90-05-0021	90-05-0027
Calcium	(ug/m3)	1.82	2.32	2.00	1.82	2.04	1.76
Chloride	(ug/m3)	0.4	0.4	0.4	0.5	0.4	0.4
Iron	(ug/m3)	0.007	-0.005	0.005	-0.005	-0.005	0.009
Fluoride	(ug/m3)	0.028	0.040	0.035	0.031	0.033	0.031
Potassium	(ug/m3)	0.15	0.15	0.15	0.16	0.14	0.15
Magnesium	(ug/m3)	0.12	0.13	0.14	0.11	0.11	0.12
Sodium	(ug/m3)	0.89	0.87	0.94	0.94	0.82	0.85
Nitrate	(ug/m3)	0.27	0.27	0.28	0.27	0.26	0.27
Sulfate	(ug/m3)	2.2	2.2	2.0	2.2	2.0	2.0
Phosphate	(ug/m3)	-0.02	-0.02	0.02	-0.02	-0.02	-0.02

A R I Z O N A   P U B L I C   S E R V I C E

Suspended Particulate

Monitoring Location		008	009	010	020	021	027
Year		90	90	90	90	90	90
Month		6	6	6	6	6	6
Lab Number		90-06-0008	90-06-0009	90-06-0010	90-06-0020	90-06-0021	90-06-0027
Calcium	(ug/m3)	1.43	2.34	2.09	1.45	1.99	1.65
Chloride	(ug/m3)	0.5	0.5	0.5	0.7	0.5	0.5
Iron	(ug/m3)	0.021	0.012	0.015	0.018	0.006	0.009
Fluoride	(ug/m3)	0.032	0.044	0.035	0.035	0.035	0.032
Potassium	(ug/m3)	0.17	0.18	0.17	0.19	0.20	0.18
Magnesium	(ug/m3)	0.11	0.15	0.15	0.11	0.13	0.11
Sodium	(ug/m3)	0.68	0.77	0.77	0.94	0.71	0.71
Nitrate	(ug/m3)	0.20	0.23	0.23	0.21	0.29	0.29
Sulfate	(ug/m3)	0.4	0.9	0.6	1.9	0.4	0.9
Phosphate	(ug/m3)	-0.02	-0.02	0.02	-0.02	-0.02	-0.02

A R I Z O N A   P U B L I C   S E R V I C E .

Suspended Particulate

Monitoring Location		008	009	010	020	021	027
Year		90	90	90	90	90	90
Month		7	7	7	7	7	7
Lab Number		90-07-0008	90-07-0009	90-07-0010	90-07-0020	90-07-0021	90-07-0027
Calcium	(ug/m3)	1.69	2.31	2.09	2.00	1.82	1.59
Chloride	(ug/m3)	0.4	0.3	0.3	0.5	0.3	0.3
Iron	(ug/m3)	0.014	0.007	0.005	0.007	0.005	0.005
Fluoride	(ug/m3)	0.033	0.040	0.038	0.038	0.035	0.033
Potassium	(ug/m3)	-0.30	-0.30	-0.30	-0.30	-0.30	-0.30
Magnesium	(ug/m3)	0.10	0.14	0.15	0.12	0.10	0.09
Sodium	(ug/m3)	0.73	0.80	0.80	0.82	0.71	0.68
Nitrate	(ug/m3)	0.24	0.29	0.31	0.26	0.23	0.24
Sulfate	(ug/m3)	2.7	2.7	2.9	2.7	2.7	2.5
Phosphate	(ug/m3)	-0.02	-0.02	0.02	-0.02	-0.02	-0.02

A R I Z O N A   P U B L I C   S E R V I C E

Suspended Particulate

Monitoring Location		008	009	010	020	021	027
Year		90	90	90	90	90	90
Month		8	8	8	8	8	8
Lab Number		90-08-0008	90-08-0009	90-08-0010	90-08-0020	90-08-0021	90-08-0027
Calcium	(ug/m3)	1.46	2.30	1.85	2.05	1.59	1.64
Chloride	(ug/m3)	0.3	0.4	0.4	0.8	0.3	0.3
Iron	(ug/m3)	0.012	0.015	0.009	0.009	0.012	0.006
Fluoride	(ug/m3)	0.038	0.038	0.038	0.038	0.035	0.029
Potassium	(ug/m3)	-0.30	-0.30	-0.30	-0.30	-0.30	-0.30
Magnesium	(ug/m3)	0.07	0.18	0.12	0.10	0.07	0.08
Sodium	(ug/m3)	0.59	0.62	0.71	1.12	0.62	0.59
Nitrate	(ug/m3)	0.18	0.21	0.22	0.22	0.18	0.19
Sulfate	(ug/m3)	2.4	1.9	2.2	2.4	1.0	1.9
Phosphate	(ug/m3)	-0.02	0.02	0.02	-0.02	-0.02	-0.02

A R I Z O N A   P U B L I C   S E R V I C E

Suspended Particulate

Monitoring Location		008	009	010	020	021	027
Year		90	90	90	90	90	90
Month		9	9	9	9	9	9
Lab Number		90-09-0008	90-09-0009	90-09-0010	90-09-0020	90-09-0021	90-09-0027
Calcium	(ug/m3)	0.87	1.25	1.03	1.23	0.73	0.68
Chloride	(ug/m3)	-0.3	-0.3	-0.3	0.4	-0.3	-0.3
Iron	(ug/m3)	-0.005	-0.005	-0.005	-0.005	-0.005	0.006
Fluoride	(ug/m3)	0.030	0.050	0.040	0.040	0.040	0.040
Potassium	(ug/m3)	-0.30	-0.30	-0.30	-0.30	-0.30	-0.30
Magnesium	(ug/m3)	0.06	0.07	0.08	0.08	0.06	0.06
Sodium	(ug/m3)	0.65	0.71	0.71	0.82	0.65	0.68
Nitrate	(ug/m3)	0.16	0.18	0.18	0.18	0.15	0.16
Sulfate	(ug/m3)	3.2	2.7	2.9	3.2	2.9	2.9
Phosphate	(ug/m3)	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02

A R I Z O N A   P U B L I C   S E R V I C E

Suspended Particulate

Monitoring Location		008	009	010	020	021	027
Year		90	90	90	90	90	90
Month		10	10	10	10	10	10
Lab Number		90-10-008	90-10-009	90-10-010	90-10-020	90-10-021	90-10-027
Calcium	(ug/m3)	1.16	2.06	1.46	1.26	1.27	0.94
Chloride	(ug/m3)	-0.3	-0.3	-0.3	0.3	-0.3	-0.3
Iron	(ug/m3)	-0.005	-0.005	0.005	0.012	-0.005	0.005
Fluoride	(ug/m3)	0.040	0.040	0.040	0.040	0.040	0.040
Potassium	(ug/m3)	-0.30	-0.30	-0.30	-0.30	-0.30	-0.30
Magnesium	(ug/m3)	0.05	0.09	0.07	0.06	0.06	0.05
Sodium	(ug/m3)	0.52	0.49	0.49	0.56	0.47	0.40
Nitrate	(ug/m3)	0.15	0.21	0.18	0.18	0.16	0.14
Sulfate	(ug/m3)	1.8	1.4	1.8	2.1	2.2	0.9
Phosphate	(ug/m3)	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02

A R I Z O N A   P U B L I C   S E R V I C E

Suspended Particulate

Monitoring Location		008	009	010	020	021	027
Year		90	90	90	90	90	90
Month		11	11	11	11	11	11
Lab Number		90-11-008	90-11-009	90-11-010	90-11-020	90-11-021	90-11-027
Calcium	(ug/m3)	1.51	2.26	1.61	1.29	1.60	1.41
Chloride	(ug/m3)	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3
Iron	(ug/m3)	0.009	0.006	-0.005	0.006	0.006	0.009
Fluoride	(ug/m3)	0.040	0.050	0.040	0.040	0.040	0.040
Potassium	(ug/m3)	-0.30	-0.30	-0.30	-0.30	-0.30	-0.30
Magnesium	(ug/m3)	0.07	0.10	0.08	0.06	0.07	0.07
Sodium	(ug/m3)	0.49	0.50	0.48	0.52	0.47	0.47
Nitrate	(ug/m3)	0.17	0.26	0.20	0.17	0.18	0.17
Sulfate	(ug/m3)	2.1	1.0	0.4	1.8	2.1	1.5
Phosphate	(ug/m3)	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02

A R I Z O N A   P U B L I C   S E R V I C E

Suspended Particulate

Monitoring Location		008	009	010	020	021	027
Year		90	90	90	90	90	90
Month		12	12	12	12	12	12
Lab Number		90-12-0008	90-12-0009	90-12-0010	90-12-0020	90-12-0021	90-12-0027
Calcium	(ug/m3)	1.23	1.68	1.36	1.22	1.50	1.36
Chloride	(ug/m3)	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3
Iron	(ug/m3)	0.006	0.009	0.009	0.006	-0.005	0.006
Fluoride	(ug/m3)	0.040	0.060	0.050	0.040	0.040	0.040
Potassium	(ug/m3)	0.14	0.17	0.15	0.14	0.14	0.14
Magnesium	(ug/m3)	0.06	0.09	0.08	0.06	0.07	0.07
Sodium	(ug/m3)	0.43	0.48	0.46	0.49	0.44	0.44
Nitrate	(ug/m3)	0.19	0.24	0.24	0.24	0.23	0.24
Sulfate	(ug/m3)	0.2	-0.2	0.2	0.3	0.3	0.3
Phosphate	(ug/m3)	-0.02	0.02	0.03	-0.02	-0.02	-0.02

Appendix E

Indigenous Vegetation Data

Indigenous vegetation data were collected during the first and fourth quarters of 1990 at eight sites: 1, 2, 3, 4, 6, 40, 42, and 44. Leaf phytomass was analyzed for nine ions in the laboratory. No rinsate, leaf area, or leaf biomass data were reported in 1990. No data were reported as missing during the 1990 data collection.

ARIZONA PUBLIC SERVICE

Indigenous Vegetation

Phytomass

Species: LARREA DIVARICATA

Monitoring Location	0001	0001	0001	0001	0001	0001	0001	0001	0001	0001
Plant ID.	01-01	01-02	01-03	01-04	01-05	01-06	01-07	01-08	01-09	01-10
Plot Number	1	2	3	4	5	6	7	8	9	10
Transect	U	U	U	U	U	U	L	L	L	L
Quarter	1	1	1	1	1	1	1	1	1	1
Month	3	3	3	3	3	3	3	3	3	3
Year	90	90	90	90	90	90	90	90	90	90
NUS Sample ID Number	1001	1002	1003	1004	1005	1006	1007	1008	1009	1010
Laboratory Number	45	46	47	48	49	50	51	52	53	54
Cations (ppm)										
Sodium	381.00	286.00	381.00	333.00	524.00	286.00	238.00	286.00	190.00	286.00
Potassium	14286.00	12857.00	11905.00	13810.00	16190.00	13810.00	11905.00	10476.00	11905.00	10000.00
Calcium	16288.00	20750.00	18000.00	14775.00	13863.00	17613.00	17588.00	16438.00	13412.00	15013.00
Magnesium	1388.00	1563.00	1050.00	1075.00	1300.00	1313.00	1563.00	1538.00	1438.00	1400.00
Anions (ppm)										
Chloride	8000.00	8400.00	8400.00	10800.00	9200.00	12600.00	8400.00	7200.00	8200.00	8400.00
Sulfate	4500.00	3000.00	5000.00	5500.00	0.00	4000.00	2400.00	0.00	0.00	500.00
Nitrate	139.00	98.00	181.00	133.00	263.00	101.00	164.00	105.00	139.00	115.00
Phosphate	1492.00	1657.00	1326.00	1740.00	1823.00	1409.00	1533.00	1533.00	994.00	1285.00
Fluoride	14.00	15.00	15.00	13.00	13.00	12.00	13.00	11.00	12.00	11.00

A R I Z O N A   P U B L I C   S E R V I C E

Indigenous Vegetation

Phytomass

Species: ATRIPLEX

Monitoring Location	0002	0002	0002	0002	0002	0002	0002	0002	0002	0002
Plant ID.	02-01	02-02	02-03	02-04	02-05	02-06	02-07	02-08	02-09	02-10
Plot Number	1	2	3	4	5	6	7	8	9	10
Transect	A	A	A	A	A	A	A	A	A	A
Quarter	1	1	1	1	1	1	1	1	1	1
Month	3	3	3	3	3	3	3	3	3	3
Year	90	90	90	90	90	90	90	90	90	90
NUS Sample ID Number	1012	1013	1014	1015	1016	1017	1018	1019	1020	1021
Laboratory Number	56	57	58	59	60	61	62	63	64	65
Cations (ppm)										
Sodium	60000.00	62500.00	73750.00	83750.00	71250.00	58750.00	76250.00	65000.00	72500.00	53750.00
Potassium	15714.00	21000.00	26500.00	15238.00	18571.00	36000.00	21000.00	23000.00	20000.00	20476.00
Calcium	14138.00	16388.00	11213.00	9475.00	14450.00	17838.00	18788.00	11675.00	10513.00	13125.00
Magnesium	5200.00	6625.00	4338.00	3838.00	7500.00	7250.00	10250.00	6875.00	3663.00	6500.00
Anions (ppm)										
Chloride	55600.00	50000.00	59200.00	58000.00	64000.00	54400.00	75600.00	53600.00	62800.00	48600.00
Sulfate	2917.00	4500.00	4417.00	6833.00	3917.00	7250.00	5833.00	2333.00	3333.00	4083.00
Nitrate	296.00	250.00	380.00	220.00	328.00	213.00	194.00	254.00	296.00	700.00
Phosphate	1409.00	1119.00	1657.00	1409.00	1492.00	1285.00	1160.00	1367.00	1823.00	2072.00
Fluoride	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	10.00

ARIZONA PUBLIC SERVICE

Indigenous Vegetation

Phytomass

Species: ATRIPLEX

Monitoring Location	0003	0003	0003	0003	0003	0003	0003	0003	0003	0003
Plant ID.	03-01	03-02	03-03	03-04	03-05	03-06	03-07	03-08	03-09	03-10
Plot Number	1	2	3	4	5	6	7	8	9	10
Transect	A	A	A	A	A	A	A	A	A	A
Quarter	1	1	1	1	1	1	1	1	1	1
Month	3	3	3	3	3	3	3	3	3	3
Year	90	90	90	90	90	90	90	90	90	90
NUS Sample ID Number	1023	1024	1025	1026	1027	1028	1029	1030	1031	1032
Laboratory Number	67	68	69	70	71	72	73	74	75	76
Cations (ppm)										
Sodium	68750.00	80000.00	86250.00	57500.00	60000.00	38750.00	72500.00	66250.00	67500.00	62500.00
Potassium	17143.00	29048.00	25714.00	34286.00	19048.00	19048.00	12381.00	33810.00	29524.00	19524.00
Calcium	24438.00	13950.00	14438.00	10588.00	11950.00	10488.00	9275.00	21000.00	14763.00	10775.00
Magnesium	9000.00	5000.00	6625.00	4363.00	6625.00	7750.00	4650.00	7250.00	7125.00	5375.00
Anions (ppm)										
Chloride	38000.00	73600.00	84000.00	77200.00	71000.00	82800.00	72400.00	53600.00	59200.00	63600.00
Sulfate	3803.00	4333.00	7250.00	7333.00	5917.00	7917.00	6833.00	2333.00	5750.00	3750.00
Nitrate	144.00	176.00	248.00	490.00	213.00	374.00	159.00	218.00	323.00	346.00
Phosphate	746.00	1699.00	1326.00	1450.00	1160.00	1409.00	1367.00	994.00	1160.00	1285.00
Fluoride	10.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00

ARIZONA PUBLIC SERVICE

Indigenous Vegetation

Phytomass

Species: LARREA DIVARICATA

Monitoring Location	0004	0004	0004	0004	0004	0004	0004	0004	0004	0004
Plant ID.	04-01	04-02	04-03	04-04	04-05	04-06	04-07	04-08	04-09	04-10
Plot Number	1	1	2	3	3	4	4	5	6	7
Transect	L	L	L	L	L	L	L	L	U	U
Quarter	1	1	1	1	1	1	1	1	1	1
Month	3	3	3	3	3	3	3	3	3	3
Year	90	90	90	90	90	90	90	90	90	90
NUS Sample ID Number	1034	1035	1036	1037	1038	1039	1040	1041	1042	1043
Laboratory Number	78	79	80	81	82	83	84	85	86	87
Cations (ppm)										
Sodium	300.00	350.00	250.00	150.00	200.00	250.00	500.00	250.00	600.00	350.00
Potassium	21905.00	19524.00	15238.00	14286.00	15714.00	16190.00	17619.00	17500.00	15000.00	13500.00
Calcium	20938.00	20787.00	15963.00	15925.00	15825.00	14100.00	18725.00	17313.00	16950.00	16475.00
Magnesium	1425.00	1888.00	1500.00	1775.00	1200.00	1400.00	1413.00	1338.00	1375.00	1438.00
Anions (ppm)										
Chloride	11600.00	8400.00	7600.00	7600.00	8200.00	7200.00	8000.00	10800.00	12400.00	8800.00
Sulfate	9924.00	5667.00	8106.00	13485.00	6250.00	7159.00	6288.00	5000.00	2800.00	800.00
Nitrate	124.00	144.00	98.00	171.00	169.00	258.00	253.00	170.00	393.00	153.00
Phosphate	1450.00	1492.00	1699.00	1533.00	1492.00	1243.00	1326.00	1409.00	1782.00	1616.00
Fluoride	12.00	14.00	14.00	14.00	15.00	14.00	15.00	14.00	14.00	15.00

ARIZONA PUBLIC SERVICE

Indigenous Vegetation

Phytomass

Species: LARREA DIVARICATA

Monitoring Location	0006	0006	0006	0006	0006	0006	0006	0006	0006	0006
Plant ID.	06-01	06-02	06-03	06-04	06-05	06-06	06-07	06-08	06-09	06-10
Plot Number	1	2	3	4	5	6	7	8	9	10
Transect	U	U	U	U	U	U	L	L	L	L
Quarter	1	1	1	1	1	1	1	1	1	1
Month	3	3	3	3	3	3	3	3	3	3
Year	90	90	90	90	90	90	90	90	90	90
NUS Sample ID Number	1045	1046	1047	1048	1049	1050	1051	1052	1053	1054
Laboratory Number	89	90	91	92	93	94	95	96	97	98
Cations (ppm)										
Sodium	150.00	300.00	200.00	300.00	200.00	150.00	200.00	200.00	250.00	200.00
Potassium	7500.00	14500.00	15000.00	13500.00	18000.00	14500.00	18000.00	14500.00	12000.00	12000.00
Calcium	24463.00	23088.00	20638.00	22288.00	16850.00	20075.00	14988.00	21325.00	18888.00	19013.00
Magnesium	2163.00	2425.00	2938.00	1625.00	1787.00	2375.00	1263.00	1625.00	1425.00	1625.00
Anions (ppm)										
Chloride	8400.00	8800.00	10800.00	11600.00	10000.00	10000.00	8000.00	8000.00	8600.00	7400.00
Sulfate	3417.00	7000.00	4417.00	7000.00	6500.00	8000.00	200.00	6500.00	7000.00	4500.00
Nitrate	76.00	115.00	283.00	194.00	218.00	111.00	196.00	171.00	204.00	59.00
Phosphate	1657.00	1657.00	1989.00	2030.00	2196.00	1906.00	1823.00	1823.00	1823.00	1409.00
Fluoride	14.00	14.00	14.00	14.00	14.00	14.00	14.00	14.00	14.00	14.00

A R I Z O N A   P U B L I C   S E R V I C E

Indigenous Vegetation

Phytomass

Species: LARREA DIVARICATA

Monitoring Location	0040	0040	0040	0040	0040	0040	0040	0040	0040	0040
Plant ID.	40-01	40-02	40-03	40-04	40-05	40-06	40-07	40-08	40-09	40-10
Plot Number	1	2	3	4	5	6	7	8	9	10
Transect	A	A	A	A	A	A	A	A	A	A
Quarter	1	1	1	1	1	1	1	1	1	1
Month	3	3	3	3	3	3	3	3	3	3
Year	90	90	90	90	90	90	90	90	90	90
NUS Sample ID Number	1056	1057	1058	1059	1060	1061	1062	1063	1064	1065
Laboratory Number	100	101	102	103	104	105	106	107	108	109
Cations (ppm)										
Sodium	400.00	350.00	350.00	700.00	250.00	263.00	421.00	316.00	421.00	316.00
Potassium	12500.00	12500.00	12000.00	11000.00	13000.00	13158.00	15263.00	13684.00	15789.00	12632.00
Calcium	16063.00	18563.00	19650.00	19625.00	17325.00	15350.00	14563.00	17225.00	18013.00	14138.00
Magnesium	1263.00	1563.00	1650.00	2725.00	1787.00	1588.00	2063.00	1188.00	1338.00	1725.00
Anions (ppm)										
Chloride	8000.00	8000.00	6400.00	7600.00	6200.00	6000.00	6600.00	5400.00	8000.00	5600.00
Sulfate	6417.00	417.00	6000.00	5500.00	6417.00	5750.00	0.00	2083.00	7538.00	0.00
Nitrate	204.00	260.00	188.00	159.00	164.00	153.00	90.00	145.00	216.00	133.00
Phosphate	1823.00	2030.00	1989.00	1492.00	1906.00	1616.00	1575.00	1367.00	1823.00	1326.00
Fluoride	14.00	14.00	12.00	13.00	13.00	14.00	15.00	16.00	17.00	17.00

ARIZONA PUBLIC SERVICE

Indigenous Vegetation

Phytomass

Species: LARREA DIVARICATA

Monitoring Location	0042	0042	0042	0042	0042	0042	0042	0042	0042	0042
Plant ID.	42-01	42-02	42-03	42-04	42-05	42-06	42-07	42-08	42-09	42-10
Plot Number	1	2	3	4	5	6	7	8	9	10
Transect	A	A	A	A	A	A	A	A	A	A
Quarter	1	1	1	1	1	1	1	1	1	1
Month	3	3	3	3	3	3	3	3	3	3
Year	90	90	90	90	90	90	90	90	90	90
NUS Sample ID Number	1067	1068	1069	1070	1071	1072	1073	1074	1075	1076
Laboratory Number	111	112	113	114	115	116	117	118	119	120
Cations (ppm)										
Sodium	368.00	211.00	263.00	158.00	421.00	263.00	263.00	368.00	263.00	211.00
Potassium	13684.00	12105.00	12105.00	7895.00	9474.00	13684.00	12632.00	11579.00	16842.00	16316.00
Calcium	17425.00	18463.00	21588.00	21550.00	22800.00	20913.00	16763.00	17975.00	16663.00	17250.00
Magnesium	1637.00	1413.00	1700.00	1463.00	1425.00	1300.00	1338.00	1775.00	1288.00	1463.00
Anions (ppm)										
Chloride	11200.00	8000.00	8800.00	7600.00	9200.00	12000.00	8800.00	6200.00	8800.00	8200.00
Sulfate	6083.00	1667.00	2917.00	2917.00	7273.00	5333.00	6742.00	7227.00	5000.00	4000.00
Nitrate	140.00	161.00	126.00	104.00	191.00	169.00	185.00	180.00	218.00	208.00
Phosphate	1657.00	1492.00	1533.00	1285.00	1326.00	1616.00	1533.00	1575.00	1699.00	1865.00
Fluoride	17.00	18.00	16.00	16.00	16.00	16.00	16.00	15.00	14.00	15.00

A R I Z O N A   P U B L I C   S E R V I C E

Indigenous Vegetation

Phytomass

Species: ATRIPLEX

Monitoring Location	0044	0044	0044	0044	0044	0044	0044	0044	0044	0044
Plant ID.	44-01	44-02	44-03	44-04	44-05	44-06	44-07	44-08	44-09	44-10
Plot Number	1	2	3	4	5	6	7	8	9	10
Transect	S	S	S	S	S	S	N	N	N	N
Quarter	1	1	1	1	1	1	1	1	1	1
Month	3	3	3	3	3	3	3	3	3	3
Year	90	90	90	90	90	90	90	90	90	90
NUS Sample ID Number	1078	1079	1080	1081	1082	1083	1084	1085	1086	1087
Laboratory Number	122	123	124	125	126	127	128	129	130	131
Cations (ppm)										
Sodium	48684.00	36842.00	43421.00	40789.00	50000.00	34211.00	44737.00	47368.00	38158.00	38158.00
Potassium	20500.00	20500.00	20500.00	12000.00	25000.00	20000.00	19000.00	9000.00	15000.00	21000.00
Calcium	10700.00	12250.00	9175.00	7263.00	11550.00	9575.00	10188.00	13050.00	8050.00	11238.00
Magnesium	8625.00	7250.00	6500.00	8750.00	4713.00	5025.00	7750.00	9625.00	7750.00	9750.00
Anions (ppm)										
Chloride	43400.00	43000.00	34200.00	39400.00	54400.00	39600.00	42200.00	44000.00	46200.00	49200.00
Sulfate	6000.00	9773.00	7955.00	8333.00	10774.00	10655.00	6250.00	7667.00	12024.00	14405.00
Nitrate	374.00	210.00	338.00	378.00	316.00	146.00	445.00	144.00	238.00	450.00
Phosphate	1865.00	2072.00	1906.00	1616.00	1699.00	1740.00	1657.00	1782.00	1285.00	1616.00
Fluoride	11.00	9.00	9.00	12.00	9.00	11.00	10.00	9.00	14.00	9.00

ARIZONA PUBLIC SERVICE

Indigenous Vegetation

Phytomass

Species: LARREA DIVARICATA

Monitoring Location	0001	0001	0001	0001	0001	0001	0001	0001	0001	0001
Plant ID.	01-01	01-02	01-03	01-04	01-05	01-06	01-07	01-08	01-09	01-10
Plot Number	1	2	3	4	5	6	7	8	9	10
Transect	U	U	U	U	U	U	L	L	L	L
Quarter	4	4	4	4	4	4	4	4	4	4
Month	10	10	10	10	10	10	10	10	10	10
Year	90	90	90	90	90	90	90	90	90	90
NUS Sample ID Number	1101	1102	1103	1104	1105	1106	1107	1108	1109	1110
Laboratory Number	817	818	819	820	821	822	823	824	825	826
Cations (ppm)										
Sodium	350.00	350.00	500.00	350.00	400.00	450.00	300.00	300.00	400.00	300.00
Potassium	14500.00	12000.00	11500.00	16500.00	16500.00	14000.00	17000.00	12500.00	14500.00	13000.00
Calcium	19325.00	24825.00	20388.00	18263.00	16588.00	19825.00	22900.00	21200.00	16000.00	18988.00
Magnesium	1475.00	1663.00	1038.00	1313.00	1413.00	1538.00	1925.00	1775.00	1763.00	1625.00
Anions (ppm)										
Chloride	6000.00	8200.00	5800.00	8200.00	7800.00	6400.00	7800.00	7600.00	6200.00	6600.00
Sulfate	0.00	3000.00	1500.00	8000.00	0.00	0.00	2000.00	4500.00	0.00	4000.00
Nitrate	109.00	91.00	114.00	86.00	144.00	71.00	129.00	65.00	99.00	79.00
Phosphate	1131.00	1218.00	1131.00	1392.00	1566.00	1392.00	1392.00	1131.00	1218.00	1305.00
Fluoride	23.00	22.00	24.00	21.00	22.00	21.00	22.00	21.00	21.00	20.00

A R I Z O N A   P U B L I C   S E R V I C E

Indigenous Vegetation

Phytomass

Species: ATRIPLEX

Monitoring Location	0002	0002	0002	0002	0002	0002	0002	0002	0002	0002
Plant ID.	02-01	02-02	02-03	02-04	02-05	02-06	02-07	02-08	02-09	02-10
Plot Number	1	2	3	4	5	6	7	8	9	10
Transect	A	A	A	A	A	A	A	A	A	A
Quarter	4	4	4	4	4	4	4	4	4	4
Month	10	10	10	10	10	10	10	10	10	10
Year	90	90	90	90	90	90	90	90	90	90
NUS Sample ID Number	1112	1113	1114	1115	1116	1117	1118	1119	1120	1121
Laboratory Number	828	829	830	831	832	833	834	835	836	837
Cations (ppm)										
Sodium	60000.00	75000.00	50000.00	80000.00	45000.00	65000.00	60000.00	45000.00	75000.00	60000.00
Potassium	16500.00	25000.00	16500.00	15500.00	16500.00	27000.00	19500.00	21500.00	16000.00	18571.00
Calcium	9400.00	9700.00	7438.00	10200.00	9675.00	11075.00	11338.00	11800.00	9163.00	11000.00
Magnesium	4800.00	4000.00	3775.00	4763.00	4775.00	5875.00	6500.00	5750.00	3363.00	5125.00
Anions (ppm)										
Chloride	50600.00	61000.00	51000.00	59600.00	64000.00	60000.00	51200.00	37000.00	70400.00	40480.00
Sulfate	2500.00	8417.00	6000.00	7000.00	9500.00	7500.00	5417.00	2917.00	3000.00	5227.00
Nitrate	244.00	600.00	191.00	140.00	228.00	290.00	129.00	129.00	88.00	248.00
Phosphate	1044.00	1044.00	1131.00	1653.00	1305.00	1044.00	1044.00	1305.00	1218.00	1392.00
Fluoride	13.00	12.00	11.00	10.00	10.00	10.00	9.00	9.00	9.00	10.00

ARIZONA PUBLIC SERVICE

Indigenous Vegetation

Phytomass

Species: ATRIPLEX

Monitoring Location	0003	0003	0003	0003	0003	0003	0003	0003	0003	0003
Plant ID.	03-01	03-02	03-03	03-04	03-05	03-06	03-07	03-08	03-09	03-10
Plot Number	1	2	3	4	5	6	7	8	9	10
Transect	A	A	A	A	A	A	A	A	A	A
Quarter	4	4	4	4	4	4	4	4	4	4
Month	10	10	10	10	10	10	10	10	10	10
Year	90	90	90	90	90	90	90	90	90	90
NUS Sample ID Number	1123	1124	1125	1126	1127	1128	1129	1130	1131	1132
Laboratory Number	839	840	841	842	843	844	845	846	847	848
Cations (ppm)										
Sodium	75000.00	70000.00	95000.00	45000.00	60000.00	70000.00	80000.00	65000.00	70000.00	60000.00
Potassium	17143.00	29000.00	22000.00	23500.00	16667.00	18571.00	15238.00	21000.00	32857.00	20500.00
Calcium	15088.00	8213.00	12088.00	9038.00	8213.00	7188.00	7213.00	10163.00	10825.00	9125.00
Magnesium	6750.00	3813.00	5250.00	4038.00	4050.00	4750.00	3775.00	4475.00	5750.00	5000.00
Anions (ppm)										
Chloride	48000.00	64000.00	66000.00	50480.00	54480.00	51520.00	71520.00	56480.00	54000.00	46000.00
Sulfate	0.00	4735.00	4773.00	5644.00	3409.00	0.00	500.00	417.00	6591.00	5189.00
Nitrate	101.00	226.00	94.00	323.00	178.00	186.00	176.00	138.00	348.00	283.00
Phosphate	957.00	1392.00	1479.00	1218.00	1392.00	1218.00	1566.00	870.00	1479.00	1218.00
Fluoride	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00

A R I Z O N A   P U B L I C   S E R V I C E

Indigenous Vegetation

Phytomass

Species: LARREA DIVARICATA

Monitoring Location	0004	0004	0004	0004	0004	0004	0004	0004	0004	0004
Plant ID.	04-01	04-02	04-03	04-04	04-05	04-06	04-07	04-08	04-09	04-10
Plot Number	1	1	2	3	3	4	4	5	6	7
Transect	L	L	L	L	L	L	L	L	U	U
Quarter	4	4	4	4	4	4	4	4	4	4
Month	10	10	10	10	10	10	10	10	10	10
Year	90	90	90	90	90	90	90	90	90	90
NUS Sample ID Number	1134	1135	1136	1137	1138	1139	1140	1141	1142	1143
Laboratory Number	850	851	852	853	854	855	856	857	858	859
Cations (ppm)										
Sodium	400.00	450.00	400.00	300.00	250.00	350.00	350.00	476.00	571.00	381.00
Potassium	20500.00	16190.00	14762.00	15238.00	16667.00	15238.00	15714.00	17500.00	15000.00	11000.00
Calcium	14438.00	13050.00	13225.00	11513.00	14175.00	13588.00	14263.00	14037.00	13900.00	15788.00
Magnesium	1413.00	1325.00	1175.00	1650.00	1288.00	1663.00	1325.00	1438.00	1313.00	1475.00
Anions (ppm)										
Chloride	6000.00	7000.00	6800.00	6400.00	7400.00	8400.00	8200.00	7400.00	8000.00	8400.00
Sulfate	0.00	0.00	4591.00	7591.00	3636.00	0.00	0.00	4500.00	1000.00	1500.00
Nitrate	65.00	93.00	174.00	63.00	106.00	108.00	118.00	135.00	175.00	165.00
Phosphate	1392.00	1305.00	1305.00	1392.00	1218.00	1218.00	1392.00	1566.00	1392.00	1305.00
Fluoride	14.00	12.00	12.00	11.00	11.00	11.00	12.00	18.00	18.00	19.00

A R I Z O N A   P U B L I C   S E R V I C E

Indigenous Vegetation

Phytomass

Species: LARREA DIVARICATA

Monitoring Location	0006	0006	0006	0006	0006	0006	0006	0006	0006	0006
Plant ID.	06-01	06-02	06-03	06-04	06-05	06-06	06-07	06-08	06-09	06-10
Plot Number	1	2	3	4	5	6	7	8	9	10
Transect	U	U	U	U	U	U	L	L	L	L
Quarter	4	4	4	4	4	4	4	4	4	4
Month	10	10	10	10	10	10	10	10	10	10
Year	90	90	90	90	90	90	90	90	90	90
NUS Sample ID Number	1145	1146	1147	1148	1149	1150	1151	1152	1153	1154
Laboratory Number	861	862	863	864	865	866	867	868	869	870
Cations (ppm)										
Sodium	571.00	381.00	333.00	333.00	333.00	381.00	381.00	333.00	333.00	381.00
Potassium	12000.00	14500.00	12500.00	14000.00	16000.00	14500.00	15000.00	15000.00	14000.00	13500.00
Calcium	20375.00	16788.00	23513.00	22063.00	19338.00	17325.00	15588.00	20738.00	15988.00	22475.00
Magnesium	2025.00	1913.00	2688.00	1900.00	1825.00	1713.00	1363.00	1700.00	1488.00	1975.00
Anions (ppm)										
Chloride	8400.00	8400.00	10000.00	7800.00	8200.00	9200.00	6800.00	8200.00	8000.00	6600.00
Sulfate	2500.00	0.00	3000.00	4000.00	3000.00	3000.00	0.00	2000.00	500.00	1500.00
Nitrate	98.00	133.00	168.00	185.00	196.00	73.00	115.00	163.00	180.00	73.00
Phosphate	1479.00	1566.00	1479.00	1653.00	1826.00	1392.00	1739.00	1826.00	1826.00	1479.00
Fluoride	20.00	19.00	19.00	19.00	19.00	19.00	19.00	18.00	19.00	19.00

A R I Z O N A   P U B L I C   S E R V I C E

Indigenous Vegetation

Phytomass

Species: LARREA DIVARICATA

Monitoring Location	0040	0040	0040	0040	0040	0040	0040	0040	0040	0040
Plant ID.	40-01	40-02	40-03	40-04	40-05	40-06	40-07	40-08	40-09	40-10
Plot Number	1	2	3	4	5	6	7	8	9	10
Transect	A	A	A	A	A	A	A	A	A	A
Quarter	4	4	4	4	4	4	4	4	4	4
Month	10	10	10	10	10	10	10	10	10	10
Year	90	90	90	90	90	90	90	90	90	90
NUS Sample ID Number	1156	1157	1158	1159	1160	1161	1162	1163	1164	1165
Laboratory Number	872	873	874	875	876	877	878	879	880	881
Cations (ppm)										
Sodium	381.00	429.00	381.00	571.00	476.00	238.00	286.00	238.00	238.00	190.00
Potassium	16500.00	15000.00	14500.00	20000.00	15000.00	17000.00	18000.00	15000.00	16000.00	16000.00
Calcium	16838.00	15113.00	19338.00	16738.00	14575.00	13200.00	12675.00	13975.00	15525.00	13388.00
Magnesium	1325.00	1625.00	1613.00	2288.00	1550.00	1050.00	1450.00	1050.00	1138.00	1413.00
Anions (ppm)										
Chloride	5800.00	6000.00	6000.00	6800.00	4800.00	4800.00	5600.00	6000.00	6000.00	5600.00
Sulfate	500.00	0.00	0.00	0.00	0.00	7000.00	3500.00	0.00	0.00	0.00
Nitrate	38.00	134.00	63.00	80.00	40.00	88.00	63.00	55.00	106.00	56.00
Phosphate	2174.00	1566.00	2174.00	2174.00	1826.00	1739.00	957.00	1913.00	1739.00	1566.00
Fluoride	19.00	20.00	19.00	20.00	20.00	16.00	17.00	17.00	17.00	16.00

A R I Z O N A   P U B L I C   S E R V I C E

Indigenous Vegetation

Phytomass

Species: LARREA DIVARICATA

Monitoring Location	0042	0042	0042	0042	0042	0042	0042	0042	0042	0042
Plant ID.	42-01	42-02	42-03	42-04	42-05	42-06	42-07	42-08	42-09	42-10
Plot Number	1	2	3	4	5	6	7	8	9	10
Transect	A	A	A	A	A	A	A	A	A	A
Quarter	4	4	4	4	4	4	4	4	4	4
Month	10	10	10	10	10	10	10	10	10	10
Year	90	90	90	90	90	90	90	90	90	90
NUS Sample ID Number	1167	1168	1169	1170	1171	1172	1173	1174	1175	1176
Laboratory Number	883	884	885	886	887	888	889	890	891	892
Cations (ppm)										
Sodium	286.00	286.00	238.00	190.00	190.00	333.00	333.00	429.00	286.00	238.00
Potassium	17500.00	11500.00	9000.00	8000.00	8000.00	14000.00	12000.00	10500.00	13500.00	12000.00
Calcium	14488.00	17700.00	21500.00	20750.00	20988.00	19788.00	14713.00	17263.00	16638.00	15650.00
Magnesium	1400.00	1425.00	1825.00	1275.00	1425.00	1700.00	1488.00	1775.00	1325.00	1338.00
Anions (ppm)										
Chloride	12400.00	7600.00	7400.00	7200.00	8800.00	12400.00	9800.00	9200.00	7600.00	6800.00
Sulfate	4500.00	0.00	2000.00	0.00	8500.00	4500.00	5500.00	5500.00	500.00	0.00
Nitrate	163.00	101.00	123.00	60.00	75.00	85.00	80.00	65.00	118.00	54.00
Phosphate	1566.00	1218.00	1218.00	957.00	957.00	1131.00	1044.00	1131.00	1305.00	1131.00
Fluoride	18.00	18.00	17.00	15.00	17.00	17.00	17.00	16.00	16.00	16.00

A R I Z O N A   P U B L I C   S E R V I C E

Indigenous Vegetation

Phytomass

Species: ATRIPLEX

Monitoring Location	0044	0044	0044	0044	0044	0044	0044	0044	0044	0044
Plant ID.	44-01	44-02	44-03	44-04	44-05	44-06	44-07	44-08	44-09	44-10
Plot Number	1	2	3	4	5	6	7	8	9	10
Transect	S	S	S	S	S	S	N	N	N	N
Quarter	4	4	4	4	4	4	4	4	4	4
Month	10	10	10	10	10	10	10	10	10	10
Year	90	90	90	90	90	90	90	90	90	90
NUS Sample ID Number	1178	1179	1180	1181	1182	1183	1184	1185	1186	1187
Laboratory Number	894	895	896	897	898	899	900	901	902	903
Cations (ppm)										
Sodium	52381.00	38095.00	38095.00	26500.00	57143.00	26000.00	42857.00	39000.00	35500.00	32500.00
Potassium	30476.00	33810.00	28421.00	11500.00	33500.00	22500.00	24500.00	21500.00	14500.00	25500.00
Calcium	8550.00	8975.00	10050.00	7200.00	9250.00	10400.00	9188.00	9850.00	7450.00	7275.00
Magnesium	6375.00	5000.00	5125.00	7375.00	4338.00	5500.00	4975.00	7625.00	5875.00	6000.00
Anions (ppm)										
Chloride	50000.00	56000.00	58000.00	24000.00	63000.00	31000.00	40000.00	39000.00	30480.00	28480.00
Sulfate	6500.00	1625.00	7250.00	5000.00	6313.00	4313.00	6000.00	4813.00	7843.00	11029.00
Nitrate	290.00	274.00	178.00	130.00	134.00	274.00	360.00	303.00	198.00	223.00
Phosphate	1739.00	1566.00	1653.00	1131.00	1392.00	957.00	1826.00	1566.00	1131.00	1305.00
Fluoride	12.00	10.00	9.00	11.00	11.00	11.00	11.00	11.00	10.00	10.00

Appendix F

Agricultural Vegetation Data

Agricultural vegetation data were collected during the second, third, and fourth quarters of 1990. Sites 11, 13, 23, 30, and 43 were sampled during the second and third quarters, and sites 11, 13, 23, and 30 during the fourth. Leaf phytomass was analyzed for nine ions in the laboratory. No rinsate, leaf area, or leaf biomass data were reported in 1990. Cotton boll biomass data were reported during the fourth quarter only. No data were reported as missing during the 1990 data collection.

A R I Z O N A   P U B L I C   S E R V I C E

Agricultural Vegetation

Phytomass

Crop: SHORT STAPLE COTTON

Monitoring Location	0011	0011	0011	0011	0011	0011	0011	0011	0011	0011
Quarter	2	2	2	2	2	2	2	2	2	2
Month	7	7	7	7	7	7	7	7	7	7
Year	90	90	90	90	90	90	90	90	90	90
Row Number	21	21	37	37	197	197	201	201	229	229
Plot Number	1	2	3	4	5	6	7	8	9	10
Paces From End	41	180	27	170	248	280	76	163	41	193
NUS Sample ID Number	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Laboratory Number	433	434	435	436	437	438	439	440	441	442
Cations (ppm)										
Sodium	1250.00	1438.00	1125.00	1563.00	1188.00	1125.00	1938.00	2158.00	1875.00	2895.00
Potassium	17778.00	21000.00	25500.00	21000.00	22000.00	20000.00	20000.00	22000.00	25500.00	23000.00
Calcium	39500.00	43125.00	42875.00	44250.00	39375.00	41125.00	43250.00	41250.00	49375.00	46250.00
Magnesium	5750.00	6625.00	5750.00	6000.00	5875.00	6125.00	5875.00	6750.00	6375.00	6000.00
Anions (ppm)										
Chloride	20000.00	17800.00	18600.00	19000.00	17600.00	17600.00	20800.00	18800.00	20000.00	19600.00
Sulfate	63077.00	55385.00	55385.00	56923.00	49231.00	49231.00	55385.00	47692.00	52308.00	49231.00
Nitrate	21.00	400.00	36.00	105.00	223.00	81.00	166.00	143.00	260.00	108.00
Phosphate	2983.00	3232.00	2818.00	3149.00	2320.00	2818.00	3149.00	2155.00	1906.00	2238.00
Fluoride	17.00	18.00	18.00	18.00	19.00	19.00	19.00	19.00	19.00	20.00
NUS Cotton Boll ID	999999	999999	999999	999999	999999	999999	999999	999999	999999	999999
Laboratory Boll ID	999999	999999	999999	999999	999999	999999	999999	999999	999999	999999
Boll Biomass (g/m2)	9999.99	9999.99	9999.99	9999.99	9999.99	9999.99	9999.99	9999.99	9999.99	9999.99

A R I Z O N A   P U B L I C   S E R V I C E

Agricultural Vegetation

Phytomass

Crop: SHORT STAPLE COTTON

Monitoring Location	0013	0013	0013	0013	0013	0013	0013	0013	0013	0013
Quarter	2	2	2	2	2	2	2	2	2	2
Month	7	7	7	7	7	7	7	7	7	7
Year	90	90	90	90	90	90	90	90	90	90
Row Number	10	10	135	135	172	172	187	187	225	225
Plot Number	1	2	3	4	5	6	7	8	9	10
Paces From End	112	131	28	87	135	80	27	145	108	137
NUS Sample ID Number	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Laboratory Number	443	444	445	446	447	448	449	450	451	452
Cations (ppm)										
Sodium	2150.00	2300.00	1737.00	1368.00	1684.00	1368.00	1895.00	1632.00	1684.00	1526.00
Potassium	22000.00	29500.00	20500.00	21000.00	22000.00	20000.00	23500.00	21500.00	23500.00	22000.00
Calcium	55875.00	61125.00	56250.00	47625.00	58875.00	47438.00	55875.00	52250.00	47625.00	49375.00
Magnesium	8250.00	8500.00	7375.00	6125.00	7250.00	6125.00	7250.00	6875.00	6000.00	6500.00
Anions (ppm)										
Chloride	21400.00	23000.00	18200.00	19200.00	20800.00	19200.00	19000.00	18800.00	18400.00	18400.00
Sulfate	59524.00	63095.00	64762.00	57143.00	62857.00	57143.00	61190.00	47619.00	41905.00	51429.00
Nitrate	40.00	151.00	36.00	134.00	43.00	51.00	103.00	190.00	495.00	470.00
Phosphate	2735.00	2652.00	3398.00	3729.00	3398.00	3564.00	3232.00	3729.00	4061.00	3895.00
Fluoride	16.00	17.00	18.00	18.00	18.00	18.00	18.00	17.00	18.00	17.00
NUS Cotton Boll ID	999999	999999	999999	999999	999999	999999	999999	999999	999999	999999
Laboratory Boll ID	999999	999999	999999	999999	999999	999999	999999	999999	999999	999999
Boll Biomass (g/m2)	9999.99	9999.99	9999.99	9999.9[illegible]	[illegible]99.99	9999.99	9999.99	9999.99	9999.99	9999.99

A R I Z O N A   P U B L I C   S E R V I C E

Agricultural Vegetation

Phytomass

Crop: SHORT STAPLE COTTON

Monitoring Location	0023	0023	0023	0023	0023	0023	0023	0023	0023	0023
Quarter	2	2	2	2	2	2	2	2	2	2
Month	7	7	7	7	7	7	7	7	7	7
Year	90	90	90	90	90	90	90	90	90	90
Row Number	32	32	47	47	49	49	107	107	242	242
Plot Number	1	2	3	4	5	6	7	8	9	10
Paces From End	215	237	18	239	139	212	67	128	57	223
NUS Sample ID Number	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Laboratory Number	383	384	385	386	387	388	389	390	391	392
Cations (ppm)										
Sodium	2050.00	2150.00	3000.00	1895.00	2450.00	1421.00	1737.00	2850.00	2250.00	1737.00
Potassium	28000.00	23000.00	15263.00	15789.00	18421.00	15789.00	23000.00	22000.00	20000.00	22000.00
Calcium	52500.00	52250.00	48875.00	48125.00	46125.00	43125.00	44375.00	45000.00	43125.00	41500.00
Magnesium	7750.00	8125.00	7125.00	7125.00	7750.00	6625.00	7250.00	8625.00	7500.00	7125.00
Anions (ppm)										
Chloride	18400.00	19200.00	18000.00	16400.00	16800.00	17000.00	18800.00	18200.00	19000.00	19000.00
Sulfate	60952.00	66667.00	66667.00	64762.00	60952.00	59048.00	59048.00	66667.00	64762.00	68452.00
Nitrate	1080.00	1040.00	58.00	164.00	129.00	120.00	268.00	740.00	224.00	520.00
Phosphate	2652.00	2320.00	2569.00	3315.00	2652.00	2818.00	2569.00	2320.00	2486.00	3398.00
Fluoride	17.00	18.00	21.00	20.00	18.00	19.00	18.00	19.00	21.00	21.00
NUS Cotton Boll ID	999999	999999	999999	999999	999999	999999	999999	999999	999999	999999
Laboratory Boll ID	999999	999999	999999	999999	999999	999999	999999	999999	999999	999999
Boll Biomass (g/m2)	9999.99	9999.99	9999.99	9999.99	9999.99	9999.99	9999.99	9999.99	9999.99	9999.99

A R I Z O N A   P U B L I C   S E R V I C E

Agricultural Vegetation

Phytomass

Crop: SHORT STAPLE COTTON

Monitoring Location	0030	0030	0030	0030	0030	0030	0030	0030	0030	0030
Quarter	2	2	2	2	2	2	2	2	2	2
Month	7	7	7	7	7	7	7	7	7	7
Year	90	90	90	90	90	90	90	90	90	90
Row Number	14	14	27	27	94	94	163	163	179	179
Plot Number	1	2	3	4	5	6	7	8	9	10
Paces From End	120	235	68	237	71	251	114	262	147	236
NUS Sample ID Number	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Laboratory Number	393	394	395	396	397	398	399	400	401	402
Cations (ppm)										
Sodium	1474.00	1263.00	1421.00	1368.00	1158.00	1579.00	1579.00	1474.00	1263.00	1263.00
Potassium	29000.00	23500.00	26000.00	20000.00	17895.00	21500.00	18947.00	20500.00	17368.00	18947.00
Calcium	40000.00	39500.00	40625.00	34500.00	34375.00	36125.00	40250.00	35000.00	40250.00	39000.00
Magnesium	6250.00	6375.00	6125.00	5000.00	5500.00	6750.00	5625.00	7625.00	7000.00	7375.00
Anions (ppm)										
Chloride	19400.00	17600.00	18000.00	17400.00	17600.00	16800.00	14200.00	14800.00	12800.00	13200.00
Sulfate	60952.00	49524.00	60571.00	54952.00	60571.00	62571.00	53048.00	56952.00	62667.00	55048.00
Nitrate	950.00	605.00	680.00	1050.00	48.00	325.00	136.00	148.00	21.00	224.00
Phosphate	3149.00	3232.00	2901.00	3066.00	2983.00	2901.00	3315.00	3398.00	2818.00	2983.00
Fluoride	20.00	20.00	19.00	18.00	19.00	19.00	19.00	20.00	20.00	19.00
NUS Cotton Boll ID	999999	999999	999999	999999	999999	999999	999999	999999	999999	999999
Laboratory Boll ID	999999	999999	999999	999999	999999	999999	999999	999999	999999	999999
Boll Biomass (g/m2)	9999.99	9999.99	9999.99	999[illegible]	9999.99	9999.99	9999.99	9999.99	9999.99	9999.99

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Agricultural Vegetation

Phytomass

Crop: ALFALFA

Monitoring Location	0043	0043	0043	0043	0043	0043	0043	0043	0043	0043
Quarter	2	2	2	2	2	2	2	2	2	2
Month	7	7	7	7	7	7	7	7	7	7
Year	90	90	90	90	90	90	90	90	90	90
Row Number	39	39	47	47	60	60	131	131	221	221
Plot Number	1	2	3	4	5	6	7	8	9	10
Paces From End	193	225	62	192	7	245	47	189	71	175
NUS Sample ID Number	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Laboratory Number	403	404	405	406	407	408	409	410	411	412
Cations (ppm)										
Sodium	1474.00	1632.00	1368.00	1632.00	2632.00	2474.00	2000.00	1789.00	1421.00	1474.00
Potassium	17500.00	20500.00	18500.00	21500.00	20500.00	21500.00	18500.00	23500.00	20500.00	16500.00
Calcium	12688.00	13238.00	13488.00	12675.00	16025.00	15438.00	17188.00	20375.00	12800.00	13888.00
Magnesium	2375.00	2700.00	2113.00	2250.00	2563.00	2950.00	2625.00	3000.00	2438.00	2588.00
Anions (ppm)										
Chloride	11000.00	12800.00	13000.00	13800.00	15600.00	14400.00	12400.00	15600.00	13600.00	10400.00
Sulfate	4167.00	4881.00	11548.00	5833.00	6667.00	9286.00	8810.00	7976.00	8810.00	5833.00
Nitrate	34.00	35.00	76.00	63.00	43.00	53.00	91.00	120.00	59.00	53.00
Phosphate	3149.00	3315.00	2901.00	2901.00	2818.00	2901.00	2983.00	3066.00	2735.00	2735.00
Fluoride	14.00	14.00	14.00	14.00	13.00	13.00	13.00	14.00	14.00	13.00
NUS Cotton Boll ID	999999	999999	999999	999999	999999	999999	999999	999999	999999	999999
Laboratory Boll ID	999999	999999	999999	999999	999999	999999	999999	999999	999999	999999
Boll Biomass (g/m2)	9999.99	9999.99	9999.99	9999.99	9999.99	9999.99	9999.99	9999.99	9999.99	9999.99

A R I Z O N A   P U B L I C   S E R V I C E

Agricultural Vegetation

Phytomass

Crop: SHORT STAPLE COTTON

Monitoring Location	0011	0011	0011	0011	0011	0011	0011	0011	0011	0011
Quarter	3	3	3	3	3	3	3	3	3	3
Month	8	8	8	8	8	8	8	8	8	8
Year	90	90	90	90	90	90	90	90	90	90
Row Number	21	21	37	37	197	197	201	201	229	229
Plot Number	1	2	3	4	5	6	7	8	9	10
Paces From End	41	180	27	170	248	280	76	163	41	193
NUS Sample ID Number	2101	2102	2103	2104	2105	2106	2107	2108	2109	2110
Laboratory Number	734	735	736	737	738	739	740	741	742	743
Cations (ppm)										
Sodium	3667.00	5455.00	5909.00	5455.00	5909.00	5000.00	5000.00	5000.00	4091.00	4091.00
Potassium	14500.00	17500.00	14000.00	13500.00	14500.00	14500.00	13500.00	17000.00	13500.00	15500.00
Calcium	40500.00	43375.00	36375.00	34125.00	31750.00	42875.00	37125.00	38250.00	30375.00	28375.00
Magnesium	5625.00	6000.00	4625.00	4750.00	3788.00	4750.00	4538.00	4875.00	3550.00	3575.00
Anions (ppm)										
Chloride	14400.00	14600.00	14400.00	13200.00	16200.00	16600.00	15200.00	12000.00	14000.00	15400.00
Sulfate	30571.00	36000.00	33143.00	28000.00	24000.00	26000.00	28000.00	32000.00	16857.00	15857.00
Nitrate	19.00	96.00	68.00	83.00	93.00	108.00	75.00	84.00	89.00	80.00
Phosphate	1392.00	1653.00	1566.00	1392.00	1653.00	2087.00	2261.00	2435.00	2435.00	2522.00
Fluoride	15.00	15.00	16.00	16.00	15.00	13.00	12.00	12.00	12.00	13.00
NUS Cotton Boll ID	999999	999999	999999	999999	999999	999999	999999	999999	999999	999999
Laboratory Boll ID	999999	999999	999999	999999	999999	999999	999999	999999	999999	999999
Boll Biomass (g/m2)	9999.99	9999.99	9999.99	999[illegible]	9999.99	9999.99	9999.99	9999.99	9999.99	9999.99

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Agricultural Vegetation

Phytomass

Crop: SHORT STAPLE COTTON

Monitoring Location	0013	0013	0013	0013	0013	0013	0013	0013	0013	0013
Quarter	3	3	3	3	3	3	3	3	3	3
Month	8	8	8	8	8	8	8	8	8	8
Year	90	90	90	90	90	90	90	90	90	90
Row Number	10	10	135	135	172	172	187	187	225	225
Plot Number	1	2	3	4	5	6	7	8	9	10
Paces From End	112	131	28	87	135	80	27	145	108	137
NUS Sample ID Number	2111	2112	2113	2114	2115	2116	2117	2118	2119	2120
Laboratory Number	744	745	746	747	748	749	750	751	752	753
Cations (ppm)										
Sodium	4545.00	3700.00	3750.00	5000.00	5000.00	4545.00	6364.00	6818.00	5000.00	4091.00
Potassium	13500.00	16500.00	15000.00	11500.00	13500.00	10000.00	15000.00	14500.00	12500.00	7500.00
Calcium	37875.00	36500.00	43250.00	36250.00	35000.00	30250.00	43375.00	42500.00	38125.00	32625.00
Magnesium	4375.00	5000.00	4688.00	4638.00	4538.00	4663.00	4863.00	5500.00	5875.00	4688.00
Anions (ppm)										
Chloride	21400.00	22200.00	23600.00	27400.00	25000.00	25600.00	21000.00	24200.00	26800.00	31600.00
Sulfate	48250.00	35000.00	37000.00	35500.00	36750.00	35500.00	36750.00	34750.00	38000.00	34000.00
Nitrate	56.00	63.00	48.00	53.00	40.00	35.00	56.00	79.00	61.00	93.00
Phosphate	2087.00	1740.00	1566.00	1566.00	1653.00	2000.00	1740.00	1740.00	1826.00	1913.00
Fluoride	14.00	14.00	15.00	14.00	14.00	14.00	14.00	15.00	14.00	14.00
NUS Cotton Boll ID	999999	999999	999999	999999	999999	999999	999999	999999	999999	999999
Laboratory Boll ID	999999	999999	999999	999999	999999	999999	999999	999999	999999	999999
Boll Biomass (g/m2)	9999.99	9999.99	9999.99	9999.99	9999.99	9999.99	9999.99	9999.99	9999.99	9999.99

A R I Z O N A   P U B L I C   S E R V I C E

Agricultural Vegetation

Phytomass

Crop: SHORT STAPLE COTTON

Monitoring Location	0023	0023	0023	0023	0023	0023	0023	0023	0023	0023
Quarter	3	3	3	3	3	3	3	3	3	3
Month	8	8	8	8	8	8	8	8	8	8
Year	90	90	90	90	90	90	90	90	90	90
Row Number	32	32	47	47	49	49	107	107	242	242
Plot Number	1	2	3	4	5	6	7	8	9	10
Paces From End	215	237	18	239	139	212	67	128	57	223
NUS Sample ID Number	2121	2122	2123	2124	2125	2126	2127	2128	2129	2130
Laboratory Number	684	685	686	687	688	689	690	691	692	693
Cations (ppm)										
Sodium	2300.00	2850.00	5000.00	5000.00	5000.00	3650.00	2700.00	2750.00	3050.00	4000.00
Potassium	14286.00	13810.00	14286.00	18095.00	19048.00	12857.00	19524.00	20952.00	19048.00	21905.00
Calcium	47000.00	56250.00	45875.00	52875.00	43625.00	43000.00	40375.00	38125.00	53250.00	51250.00
Magnesium	6000.00	6750.00	4875.00	5125.00	5500.00	4350.00	5250.00	6625.00	8125.00	8500.00
Anions (ppm)										
Chloride	13680.00	12800.00	18000.00	12800.00	17000.00	13600.00	15000.00	16800.00	17200.00	16400.00
Sulfate	27321.00	25417.00	19702.00	23512.00	19375.00	21280.00	19375.00	34286.00	19000.00	21280.00
Nitrate	46.00	54.00	28.00	35.00	39.00	24.00	60.00	118.00	258.00	510.00
Phosphate	1740.00	1479.00	2435.00	1653.00	2000.00	1826.00	2783.00	2696.00	2435.00	1913.00
Fluoride	12.00	13.00	12.00	12.00	11.00	12.00	11.00	12.00	11.00	12.00
NUS Cotton Boll ID	999999	999999	999999	999999	999999	999999	999999	999999	999999	999999
Laboratory Boll ID	999999	999999	999999	999999	999999	999999	999999	999999	999999	999999
Boll Biomass (g/m2)	9999.99	9999.99	9999.99	99[illegible]	9999.99	9999.99	9999.99	9999.99	9999.99	9999.99

A R I Z O N A   P U B L I C   S E R V I C E

Agricultural Vegetation

Phytomass

Crop: SHORT STAPLE COTTON

Monitoring Location	0030	0030	0030	0030	0030	0030	0030	0030	0030	0030
Quarter	3	3	3	3	3	3	3	3	3	3
Month	8	8	8	8	8	8	8	8	8	8
Year	90	90	90	90	90	90	90	90	90	90
Row Number	14	14	27	27	94	94	163	163	179	179
Plot Number	1	2	3	4	5	6	7	8	9	10
Paces From End	120	235	68	237	71	251	114	262	147	236
NUS Sample ID Number	2131	2132	2133	2134	2135	2136	2137	2138	2139	2140
Laboratory Number	694	695	696	697	698	699	700	701	702	703
Cations (ppm)										
Sodium	1895.00	2000.00	2350.00	2050.00	2650.00	2700.00	2700.00	3450.00	1789.00	2550.00
Potassium	19048.00	18571.00	16667.00	19524.00	15238.00	13810.00	20476.00	20476.00	16190.00	20000.00
Calcium	53750.00	43000.00	46375.00	44125.00	43500.00	48875.00	42875.00	54500.00	55000.00	58500.00
Magnesium	6250.00	5250.00	5375.00	6125.00	5250.00	6625.00	6375.00	7625.00	7375.00	8625.00
Anions (ppm)										
Chloride	17600.00	14600.00	17600.00	14400.00	14800.00	16400.00	17200.00	13400.00	15200.00	16000.00
Sulfate	29851.00	25744.00	31458.00	27649.00	25744.00	24792.00	24792.00	27649.00	27976.00	23839.00
Nitrate	28.00	39.00	35.00	61.00	30.00	43.00	31.00	128.00	28.00	59.00
Phosphate	2522.00	2087.00	1826.00	2000.00	1826.00	1913.00	2087.00	2087.00	1913.00	2000.00
Fluoride	12.00	12.00	11.00	11.00	11.00	11.00	11.00	11.00	10.00	10.00
NUS Cotton Boll ID	999999	999999	999999	999999	999999	999999	999999	999999	999999	999999
Laboratory Boll ID	999999	999999	999999	999999	999999	999999	999999	999999	999999	999999
Boll Biomass (g/m2)	9999.99	9999.99	9999.99	9999.99	9999.99	9999.99	9999.99	9999.99	9999.99	9999.99

A R I Z O N A   P U B L I C   S E R V I C E

Agricultural Vegetation

Phytomass

Crop: ALFALFA

Monitoring Location	0043	0043	0043	0043	0043	0043	0043	0043	0043	0043
Quarter	3	3	3	3	3	3	3	3	3	3
Month	8	8	8	8	8	8	8	8	8	8
Year	90	90	90	90	90	90	90	90	90	90
Row Number	39	39	47	47	60	60	131	131	221	221
Plot Number	1	2	3	4	5	6	7	8	9	10
Paces From End	193	225	62	192	7	245	47	189	71	175
NUS Sample ID Number	2141	2142	2143	2144	2145	2146	2147	2148	2149	2150
Laboratory Number	704	705	706	707	708	709	710	711	712	713
Cations (ppm)										
Sodium	1632.00	2105.00	1737.00	1684.00	1526.00	1263.00	1737.00	1316.00	1421.00	1053.00
Potassium	30000.00	30000.00	30500.00	31000.00	35500.00	29500.00	28000.00	29000.00	27000.00	29000.00
Calcium	12888.00	11863.00	15575.00	12150.00	12725.00	12838.00	13775.00	13700.00	11463.00	11263.00
Magnesium	3350.00	3475.00	3500.00	3363.00	3338.00	3363.00	3125.00	3200.00	3325.00	3063.00
Anions (ppm)										
Chloride	12800.00	12000.00	12800.00	10800.00	11800.00	12400.00	11000.00	10400.00	12200.00	10200.00
Sulfate	12429.00	13500.00	13714.00	12000.00	11429.00	12000.00	11714.00	11714.00	6000.00	3000.00
Nitrate	660.00	540.00	730.00	460.00	400.00	186.00	460.00	680.00	245.00	640.00
Phosphate	4871.00	5219.00	3131.00	5132.00	4958.00	4697.00	4784.00	4871.00	4001.00	4697.00
Fluoride	13.00	13.00	13.00	13.00	13.00	14.00	14.00	14.00	14.00	13.00
NUS Cotton Boll ID	999999	999999	999999	999999	999999	999999	999999	999999	999999	999999
Laboratory Boll ID	999999	999999	999999	999999	999999	999999	999999	999999	999999	999999
Boll Biomass (g/m2)	9999.99	9999.99	9999.99	999[illegible]	9999.99	9999.99	9999.99	9999.99	9999.99	9999.99

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Agricultural Vegetation

Phytomass

Crop: SHORT STAPLE COTTON

Monitoring Location	0011	0011	0011	0011	0011	0011	0011	0011	0011	0011
Quarter	4	4	4	4	4	4	4	4	4	4
Month	10	10	10	10	10	10	10	10	10	10
Year	90	90	90	90	90	90	90	90	90	90
Row Number	21	21	37	37	197	197	201	201	229	229
Plot Number	1	2	3	4	5	6	7	8	9	10
Paces From End	41	180	27	170	248	280	76	163	41	193
NUS Sample ID Number	99999	99999	99999	99999	99999	99999	99999	99999	99999	99999
Laboratory Number	99999	99999	99999	99999	99999	99999	99999	99999	99999	99999
Cations (ppm)										
Sodium	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99
Potassium	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99
Calcium	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99
Magnesium	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99
Anions (ppm)										
Chloride	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99
Sulfate	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99
Nitrate	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99
Phosphate	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99
Fluoride	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99
NUS Cotton Boll ID	9001	9002	9003	9004	9005	9006	9007	9008	9009	9010
Laboratory Boll ID	999999	999999	999999	999999	999999	999999	999999	999999	999999	999999
Boll Biomass (g/m2)	470.80	380.60	489.80	440.70	752.00	757.80	734.20	591.80	616.10	507.40

A R I Z O N A   P U B L I C   S E R V I C E

Agricultural Vegetation

Phytomass

Crop: SHORT STAPLE COTTON

Monitoring Location	0013	0013	0013	0013	0013	0013	0013	0013	0013	0013
Quarter	4	4	4	4	4	4	4	4	4	4
Month	10	10	10	10	10	10	10	10	10	10
Year	90	90	90	90	90	90	90	90	90	90
Row Number	10	10	135	135	172	172	187	187	225	225
Plot Number	1	2	3	4	5	6	7	8	9	10
Paces From End	112	131	28	87	135	80	27	145	108	137
NUS Sample ID Number	99999	99999	99999	99999	99999	99999	99999	99999	99999	99999
Laboratory Number	99999	99999	99999	99999	99999	99999	99999	99999	99999	99999
Cations (ppm)										
Sodium	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99
Potassium	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99
Calcium	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99
Magnesium	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99
Anions (ppm)										
Chloride	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99
Sulfate	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99
Nitrate	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99
Phosphate	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99
Fluoride	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99
NUS Cotton Boll ID	9011	9012	9013	9014	9015	9016	9017	9018	9019	9020
Laboratory Boll ID	999999	999999	999999	999999	999999	999999	999999	999999	999999	999999
Boll Biomass (g/m2)	596.50	517.20	593.40	6[illegible]	571.30	519.30	702.60	686.30	533.60	345.30

A R I Z O N A P U B L I C S E R V I C E

Agricultural Vegetation

Phytomass

Crop: SHORT STAPLE COTTON

Monitoring Location	0023	0023	0023	0023	0023	0023	0023	0023	0023	0023
Quarter	4	4	4	4	4	4	4	4	4	4
Month	10	10	10	10	10	10	10	10	10	10
Year	90	90	90	90	90	90	90	90	90	90
Row Number	32	32	47	47	49	49	107	107	242	242
Plot Number	1	2	3	4	5	6	7	8	9	10
Paces From End	215	237	18	237	139	212	67	128	57	223
NUS Sample ID Number	99999	99999	99999	99999	99999	99999	99999	99999	99999	99999
Laboratory Number	99999	99999	99999	99999	99999	99999	99999	99999	99999	99999
Cations (ppm)										
Sodium	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99
Potassium	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99
Calcium	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99
Magnesium	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99
Anions (ppm)										
Chloride	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99
Sulfate	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99
Nitrate	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99
Phosphate	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99
Fluoride	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99
NUS Cotton Boll ID	9021	9022	9023	9024	9025	9026	9027	9028	9029	9030
Laboratory Boll ID	999999	999999	999999	999999	999999	999999	999999	999999	999999	999999
Boll Biomass (g/m2)	729.60	934.50	1014.40	906.80	810.80	797.30	931.50	694.00	843.30	557.60

A R I Z O N A   P U B L I C   S E R V I C E

Agricultural Vegetation

Phytomass

Crop: SHORT STAPLE COTTON

Monitoring Location	0030	0030	0030	0030	0030	0030	0030	0030	0030	0030
Quarter	4	4	4	4	4	4	4	4	4	4
Month	10	10	10	10	10	10	10	10	10	10
Year	90	90	90	90	90	90	90	90	90	90
Row Number	14	14	27	27	94	94	163	163	179	179
Plot Number	1	2	3	4	5	6	7	8	9	10
Paces From End	120	235	68	237	71	251	114	262	147	236
NUS Sample ID Number	99999	99999	99999	99999	99999	99999	99999	99999	99999	99999
Laboratory Number	99999	99999	99999	99999	99999	99999	99999	99999	99999	99999
Cations (ppm)										
Sodium	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99
Potassium	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99
Calcium	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99
Magnesium	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99
Anions (ppm)										
Chloride	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99
Sulfate	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99
Nitrate	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99
Phosphate	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99
Fluoride	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99	999999.99
NUS Cotton Boll ID	9031	9032	9033	9034	9035	9036	9037	9038	9039	9040
Laboratory Boll ID	999999	999999	999999	999999	999999	999999	999999	999999	999999	999999
Boll Biomass (g/m2)	718.70	678.40	825.90	73[illegible]	489.30	364.80	486.70	456.40	596.90	642.10

Appendix G
Soils Data

Included in this appendix are tabulations of data on the soil texture at each of the 44 sites (1-28 and 30-45) where soil samples were collected, as well as laboratory analysis data on electrical conductivity (EC x 1000), soluble salts, pH, and the concentrations of 17 ions.

The soils texture data are presented for two depth levels, an upper level of 0 to 15 centimeters, and a lower level of 15 to 30 centimeters.

The results of laboratory analysis are presented for each of two collocated samples (A and B) for the upper and lower levels (U and L). Samples collected during the second, third, and fourth quarters of 1990 represent the wet, dry, and postdefoliation seasons, respectively. The postdefoliation season is defined as the period following the cotton crop harvest.

A minus sign preceding a value indicates that the value was below the detectable limit of the laboratory procedure. Missing data are presented as a field of "9s." Phosphorus has been discontinued as an analyte and is not reported.

	Soil Texture	
Site	Upper Level (0 - 15 cm)	Lower Level (15 - 30 cm)
1	Sandy Loam	Sandy Loam
2	Silt Loam-Loam	Loam
3	Silt Loam-Loam	Sandy Loam
4	Sandy Loam	Sandy Loam
5	Sandy Loam	Sandy Loam
6	Sandy Loam	Sandy Loam
7	Sandy Loam	Sandy Loam
8	Sandy Loam	Loamy Sand
9	Loam	Loam-Sandy Loam
10	Loamy Sand-Sandy Loam	Sandy Loam
11	Silt Loam	Silt Loam
12	Loam	Sandy Loam
13	Loam-Sandy Clay Loam	Loam-Sandy Loam
14	Silt Loam	Loam
15	Sandy Loam	Sandy Loam
16	Sandy Loam	Sandy Loam-Sandy Clay Loam
17	Loamy Sand-Sandy Loam	Loamy Sand-Sandy Loam
18	Sandy Loam	Sandy Loam
19	Silt Loam-Loam	Silt Loam
20	Sandy Loam	Sandy Loam-Loamy Sand
21	Sandy Loam	Sandy Loam
22	Sandy Loam-Loamy Sand	Sandy Loam
23	Loam-Silt Loam	Silt Loam
24	Silt Loam-Loam	Loam
25	Loam	Loam
26	Sandy Loam	Loam
27	Sandy Loam	Sandy Loam
28	Sandy Loam	Loam-Sandy Loam
29	Loam	Loam
30	Silt Loam	Loam-Silt Loam
31	Sandy Loam	Sandy Loam
32	Sandy Loam	Sandy Loam
33	Sand	Sand
34	Sandy Loam	Sandy Loam
35	Loamy Sand-Sand	Sand
36	Sandy Loam	Sandy Loam
37	Sandy Loam	Sandy Loam
38	Sandy Loam	Sandy Loam
39	Sandy Loam	Sandy Loam
40	Sandy Loam-Loam	Sandy Loam
41	Sandy Loam	Sandy Loam
42	Sandy Loam	Sandy Loam
43	Silt Loam	Silt Loam
44	Silt Loam	Silt Loam
45	Loam-Clay Loam	Loam-Clay Loam

Raw Soi[illegible]e Data

For Quarter 2/90

Site	Qr	Yr	Mn	Sea	Id Num	Lab Num	EC x 1000	Solu Salts ppm	pH	Ca ppm	Mg ppm	Na ppm	Cl ppm	SO4 ppm	HCO3 ppm	CO3 ppm	F ppm	NO3-N ppm	Boron ppm	NH4 ppm	PO4-P ppm	k ppm
01AL	2	90	4	WET	888	148	0.44	282	8.5	45	3	63	42	48.0	163	-4.8	0.33	10.00	0.93	2.50	0.99	4
01AU	2	90	4	WET	887	147	0.36	230	8.5	47	4	32	30	26.0	166	-4.8	0.21	7.50	0.87	3.00	1.33	8
01BL	2	90	4	WET	890	150	1.60	1024	8.1	217	12	189	156	340.0	109	-4.8	0.40	62.50	2.53	4.00	0.99	6
01BU	2	90	4	WET	889	149	1.20	768	8.2	120	8	118	86	257.0	128	-4.8	0.23	41.25	2.00	3.00	1.33	11
02AL	2	90	4	WET	896	156	0.44	282	8.6	41	6	42	28	27.0	201	-4.8	0.24	9.38	0.73	3.00	3.32	29
02AU	2	90	4	WET	895	155	0.72	461	9.1	20	3	189	84	39.0	279	-4.8	0.70	13.75	1.10	6.88	1.66	10
02BL	2	90	4	WET	898	158	0.76	486	9.0	23	4	211	98	31.0	289	9.0	0.44	14.38	1.13	5.00	3.32	15
02BU	2	90	4	WET	897	157	0.40	256	8.7	32	5	51	16	27.0	237	-4.8	0.22	7.50	0.87	3.00	3.98	27
03AL	2	90	4	WET	948	204	8.00	5120	8.8	63	12	2609	2440	552.0	180	19.0	8.20	125.00	48.33	1.00	1.99	30
03AU	2	90	4	WET	947	203	2.80	1792	8.9	27	4	635	744	57.0	227	5.0	1.70	32.50	4.00	3.00	3.32	20
03BL	2	90	4	WET	950	206	10.00	6400	8.7	93	17	2783	2592	781.0	137	33.0	9.60	185.00	59.17	-2.50	1.33	34
03BU	2	90	4	WET	949	205	4.40	2816	9.0	29	4	1053	1264	130.0	213	26.0	4.40	60.00	25.83	1.00	2.98	28
04AL	2	90	4	WET	916	176	0.36	230	8.5	52	4	18	18	20.0	166	-4.8	0.36	4.00	0.69	-2.50	0.33	12
04AU	2	90	4	WET	915	175	0.34	218	8.5	50	4	18	16	13.0	170	-4.8	0.52	3.75	0.62	-2.50	0.33	12
04BL	2	90	4	WET	918	178	0.44	282	8.3	64	5	24	36	16.0	170	-4.8	0.29	6.88	0.69	0.50	0.66	12
04BU	2	90	4	WET	917	177	0.38	243	8.3	59	4	16	14	23.0	189	-4.8	0.29	4.38	0.62	2.00	0.33	12
05AL	2	90	4	WET	904	164	0.52	333	9.0	23	3	113	16	3.0	265	-4.8	5.00	4.25	1.19	-2.50	1.66	6
05AU	2	90	4	WET	903	163	0.52	333	8.8	29	4	93	24	35.0	222	-4.8	3.20	6.25	1.35	1.00	1.99	12
05BL	2	90	4	WET	906	166	0.80	512	9.2	22	4	200	34	36.0	308	14.0	15.00	8.13	2.46	-2.50	1.33	6
05BU	2	90	4	WET	905	165	0.44	282	8.8	30	3	80	12	-2.5	225	-4.8	3.20	5.13	1.23	-2.50	1.99	16
06AL	2	90	4	WET	908	168	0.28	179	8.4	51	4	34	12	-2.5	204	-4.8	0.32	4.50	0.69	5.83	1.33	4
06AU	2	90	4	WET	907	167	0.28	179	8.5	50	4	20	10	-2.5	175	-4.8	0.44	3.88	0.54	1.00	0.66	6
06BL	2	90	4	WET	910	170	0.38	243	8.6	39	3	58	14	-2.5	204	-4.8	0.33	3.88	0.62	1.00	0.33	2
06BU	2	90	4	WET	909	169	0.32	205	8.4	58	4	18	16	-2.5	196	-4.8	0.28	5.00	0.58	4.50	1.33	6
07AL	2	90	4	WET	2	260	0.56	358	8.9	24	5	124	26	43.0	275	5.0	0.30	8.75	1.80	1.25	2.65	8
07AU	2	90	4	WET	1	259	0.56	358	8.8	27	5	103	20	-2.5	275	2.0	0.21	6.88	1.40	1.25	4.64	13
07BL	2	90	4	WET	4	262	0.88	563	8.8	25	5	171	62	53.0	320	2.0	4.60	15.63	2.00	1.25	2.32	6
07BU	2	90	4	WET	3	261	0.64	410	8.8	25	4	137	32	43.0	284	2.0	0.31	11.25	1.70	1.25	3.65	8
08AL	2	90	4	WET	940	196	2.00	1280	9.7	27	5	460	408	180.0	249	37.0	1.00	25.00	5.43	-2.50	3.98	20
08AU	2	90	4	WET	939	195	0.84	538	9.3	19	4	158	122	-2.5	237	14.0	0.66	8.13	1.07	-2.50	4.31	26
08BL	2	90	4	WET	942	198	0.72	461	8.9	27	4	118	140	33.0	140	-4.8	0.40	6.25	0.71	-2.50	2.32	8
08BU	2	90	4	WET	941	197	0.40	256	8.6	36	5	38	52	15.0	123	-4.8	3.90	5.50	0.57	-2.50	1.99	12
09AL	2	90	4	WET	900	160	0.36	230	8.6	36	7	25	16	12.0	199	-4.8	0.21	6.25	0.80	5.00	4.64	34
09AU	2	90	4	WET	899	159	0.42	269	8.5	55	7	27	12	-2.5	227	-4.8	0.22	15.00	1.03	5.00	4.97	32
09BL	2	90	4	WET	902	162	0.60	384	8.4	51	9	40	28	87.0	180	-4.8	0.20	18.75	1.00	7.81	4.64	50
09BU	2	90	4	WET	901	161	0.32	205	8.6	42	6	23	12	27.0	199	-4.8	0.20	5.63	0.93	6.88	4.31	25
10AL	2	90	4	WET	892	152	0.30	192	8.5	41	5	23	20	11.0	166	-4.8	0.52	5.50	0.63	2.00	1.33	8
10AU	2	90	4	WET	891	151	0.26	166	8.6	42	4	13	12	-2.5	156	-4.8	0.39	5.00	0.47	4.00	1.99	10
10BL	2	90	4	WET	894	154	0.46	294	8.3	50	6	42	34	32.0	168	-4.8	0.42	15.63	1.13	4.00	1.33	10
10BU	2	90	4	WET	893	153	0.28	179	8.5	46	5	17	12	-2.5	170	-4.8	0.40	6.25	0.80	2.00	2.65	10
11AL	2	90	4	WET	944	200	1.20	768	8.7	33	4	220	144	135.0	289	-4.8	13.00	6.25	1.79	-2.50	0.99	26
11AU	2	90	4	WET	943	199	1.20	768	8.6	36	4	220	158	135.0	272	-4.8	12.00	8.75	1.93	-2.50	0.99	28
11BL	2	90	4	WET	946	202	1.20	768	8.5	42	5	240	170	172.0	296	-4.8	14.00	6.88	1.82	-2.50	0.99	36
11BU	2	90	4	WET	945	201	1.40	896	8.5	40	5	240	152	173.0	322	-4.8	13.00	6.88	2.14	-2.50	0.99	36

Raw Soil Sample Data

For Quarter 2/90

Site	Qr	Yr	Mn	Sea	Id Num	Lab Num	EC x 1000	Solu Salts ppm	pH	Ca ppm	Mg ppm	Na ppm	Cl ppm	SO4 ppm	HCO3 ppm	CO3 ppm	F ppm	NO3-N ppm	Boron ppm	NH4 ppm	PO4-P ppm	k ppm
12AL	2	90	4	WET	932	192	3.20	2048	8.3	100	11	640	696	390.0	185	-4.8	5.60	75.00	2.86	-2.50	3.65	84
12AU	2	90	4	WET	931	191	2.50	1600	8.3	86	8	480	510	210.0	142	-4.8	3.70	85.00	2.93	-2.50	4.31	76
12BL	2	90	4	WET	934	194	3.20	2048	8.3	96	10	640	708	282.0	137	-4.8	5.40	90.00	3.50	-2.50	3.98	84
12BU	2	90	4	WET	933	193	1.90	1216	8.6	43	4	340	316	213.0	182	-4.8	4.80	45.00	2.79	-2.50	3.65	52
13AL	2	90	4	WET	936	332	0.84	538	8.4	33	4	148	80	64.0	289	-4.8	7.00	4.13	0.80	1.00	1.99	16
13AU	2	90	4	WET	935	331	1.00	640	8.4	33	4	160	98	40.0	312	-4.8	5.40	4.50	0.93	-2.50	2.32	14
13BL	2	90	4	WET	938	334	0.92	589	8.4	35	4	160	88	68.0	289	-4.8	6.40	4.63	0.73	1.00	2.32	14
13BU	2	90	4	WET	937	333	1.00	640	8.5	34	4	180	92	40.0	315	-4.8	5.20	4.38	0.73	-2.50	2.65	12
14AL	2	90	4	WET	884	144	1.10	704	8.4	56	9	150	96	68.0	180	-4.8	0.23	60.00	0.97	3.00	2.65	67
14AU	2	90	4	WET	883	143	0.88	563	8.6	46	8	69	32	108.0	296	-4.8	0.20	42.50	2.20	4.00	0.33	132
14BL	2	90	4	WET	886	146	1.26	806	8.4	64	10	156	140	87.0	175	-4.8	0.22	55.00	1.07	4.00	2.65	76
14BU	2	90	4	WET	885	145	1.04	666	8.5	48	8	100	72	99.0	227	-4.8	0.21	57.50	1.40	3.00	2.98	132
15AL	2	90	4	WET	960	216	0.32	205	8.3	57	5	12	18	22.0	151	-4.8	0.24	9.38	0.42	-2.50	1.33	10
15AU	2	90	4	WET	959	215	0.28	179	8.4	54	4	9	12	-2.5	175	-4.8	0.32	4.00	0.42	-2.50	1.66	14
15BL	2	90	4	WET	962	218	0.28	179	8.3	55	5	12	16	14.0	159	-4.8	0.28	7.50	0.83	-2.50	1.99	12
15BU	2	90	4	WET	961	217	0.28	179	8.4	54	5	9	12	-2.5	170	-4.8	0.19	4.50	0.33	-2.50	1.66	14
16AL	2	90	4	WET	952	208	6.40	4096	8.9	64	12	2435	1800	479.0	289	21.0	3.10	312.50	35.83	1.00	1.66	55
16AU	2	90	4	WET	951	207	3.20	2048	9.0	35	5	635	664	132.0	222	16.0	1.00	100.00	14.58	-2.50	4.97	38
16BL	2	90	4	WET	954	210	9.00	5760	9.0	50	10	2609	1968	419.0	237	30.0	2.20	312.50	40.83	-2.50	2.32	80
16BU	2	90	4	WET	953	209	2.50	1600	9.0	32	4	565	576	99.0	206	14.0	0.62	90.00	9.17	-2.50	6.30	46
17AL	2	90	4	WET	980	236	0.56	358	8.5	71	20	15	16	-2.5	246	-4.8	0.18	18.13	1.92	1.43	7.29	84
17AU	2	90	4	WET	979	235	0.44	282	8.4	75	14	15	12	-2.5	232	-4.8	0.26	10.00	1.54	2.86	10.61	57
17BL	2	90	4	WET	982	238	0.56	358	8.5	71	14	15	20	-2.5	303	-4.8	0.15	11.88	1.38	1.43	8.62	76
17BU	2	90	4	WET	981	237	0.68	435	8.4	108	20	15	24	-2.5	336	-4.8	0.14	26.25	1.81	2.50	15.25	76
18AL	2	90	4	WET	62	320	0.34	218	8.2	61	5	16	16	13.0	194	-4.8	0.34	3.63	0.57	3.75	1.33	4
18AU	2	90	4	WET	61	319	0.36	230	8.2	60	5	14	24	-2.5	208	-4.8	0.27	4.13	0.50	2.50	1.66	8
18BL	2	90	4	WET	64	322	0.32	205	8.1	64	5	14	16	-2.5	208	-4.8	0.30	3.38	0.57	2.50	1.33	4
18BU	2	90	4	WET	63	321	0.32	205	8.2	58	5	12	12	-2.5	194	-4.8	0.24	3.63	0.43	3.13	1.33	8
19AL	2	90	4	WET	66	324	0.72	461	8.7	31	5	52	26	-2.5	296	-4.8	0.66	6.88	0.93	3.00	4.31	116
19AU	2	90	4	WET	65	323	0.56	358	8.4	45	6	42	18	-2.5	241	-4.8	0.30	8.13	0.40	3.00	5.30	51
19BL	2	90	4	WET	68	326	0.64	410	8.4	44	6	40	22	43.0	237	-4.8	0.42	12.50	0.27	2.00	3.98	72
19BU	2	90	4	WET	67	325	0.52	333	8.5	42	6	22	14	37.0	260	-4.8	0.35	5.00	0.27	5.00	4.64	91
20AL	2	90	4	WET	70	328	0.66	422	9.0	22	5	160	26	2.0	341	19.0	8.00	5.00	1.20	2.00	4.31	24
20AU	2	90	4	WET	69	327	0.52	333	8.6	29	5	74	20	-2.5	260	-4.8	1.90	4.00	0.47	2.00	4.97	36
20BL	2	90	4	WET	72	330	0.76	486	9.0	26	7	160	20	-2.5	327	33.0	7.60	5.13	1.07	0.50	4.31	22
20BU	2	90	4	WET	71	329	0.56	358	8.7	26	5	104	16	-2.5	296	5.0	2.70	4.88	0.13	3.00	5.97	40
21AL	2	90	4	WET	30	288	1.60	1024	9.2	16	5	380	300	94.0	374	28.0	0.37	8.75	3.22	-2.50	3.65	32
21AU	2	90	4	WET	29	287	0.40	256	8.7	24	5	74	28	-2.5	244	-4.8	0.18	2.75	1.11	-2.50	4.97	21
21BL	2	90	4	WET	32	290	0.96	614	9.3	17	7	220	108	-2.5	336	47.0	0.40	3.75	1.33	-2.50	3.32	25
21BU	2	90	4	WET	31	289	0.32	205	8.7	27	5	52	26	-2.5	204	-4.8	0.20	2.88	1.00	-2.50	4.97	19
22AL	2	90	4	WET	34	292	0.28	179	8.3	49	5	10	12	13.0	166	-4.8	0.48	2.88	1.00	-2.50	0.99	4
22AU	2	90	4	WET	33	291	0.26	166	8.3	46	4	6	12	4.0	166	-4.8	0.28	2.75	0.89	-2.50	1.99	8
22BL	2	90	4	WET	36	294	0.24	154	8.3	46	4	10	12	2.0	161	-4.8	0.48	2.75	1.78	-2.50	1.33	4
22BU	2	90	4	WET	35	293	0.20	128	8.4	46	4	4	12	-2.5	161	-4.8	0.27	2.44	0.89	-2.50	2.32	6

Raw Soil Sa[illegible]ta

For Quarter 2/90

Site	Qr	Yr	Mn	Sea	Id Num	Lab Num	EC x 1000	Solu Salts ppm	pH	Ca ppm	Mg ppm	Na ppm	Cl ppm	SO4 ppm	HCO3 ppm	CO3 ppm	F ppm	NO3-N ppm	Boron ppm	NH4 ppm	PO4-P ppm	k ppm
23AL	2	90	4	WET	968	224	1.10	704	8.6	43	4	255	144	110.0	303	-4.8	8.00	9.38	1.69	1.43	2.65	8
23AU	2	90	4	WET	967	223	1.40	896	8.5	56	6	345	252	228.0	241	-4.8	7.00	16.88	2.00	0.71	3.32	8
23BL	2	90	4	WET	970	226	0.82	525	8.7	46	4	255	132	110.0	308	-4.8	9.00	7.50	1.62	1.07	2.98	6
23BU	2	90	4	WET	969	225	1.40	896	8.6	47	5	309	212	150.0	284	-4.8	5.80	14.38	1.92	0.71	2.98	8
24AL	2	90	4	WET	956	212	1.20	768	8.5	40	5	261	142	64.0	194	-4.8	3.50	52.50	1.58	-2.50	2.32	24
24AU	2	90	4	WET	955	211	1.24	794	8.4	48	7	226	156	52.0	175	-4.8	2.20	47.50	1.58	-2.50	1.33	38
24BL	2	90	4	WET	958	214	0.84	538	8.7	26	4	226	68	33.0	241	5.0	4.80	28.75	1.25	-2.50	0.99	14
24BU	2	90	4	WET	957	213	0.72	461	8.7	28	4	136	48	32.0	251	-4.8	3.00	25.00	1.50	1.00	2.32	32
25AL	2	90	4	WET	920	180	1.60	1024	8.1	119	23	180	124	300.0	156	-4.8	1.70	35.00	1.46	1.00	0.99	24
25AU	2	90	4	WET	919	179	2.30	1472	7.9	221	42	180	172	480.0	322	-4.8	1.30	57.50	1.62	5.00	1.66	51
25BL	2	90	4	WET	922	182	1.80	1152	8.1	161	32	180	168	330.0	166	-4.8	1.40	70.00	1.08	1.00	0.99	32
25BU	2	90	4	WET	921	181	2.00	1280	8.0	176	34	200	180	340.0	161	-4.8	1.30	70.00	1.31	3.00	0.99	38
26AL	2	90	4	WET	14	272	0.32	205	8.4	48	4	16	20	6.0	154	-4.8	0.50	3.75	0.67	1.00	1.33	2
26AU	2	90	4	WET	13	271	0.28	179	8.5	47	4	9	18	-2.5	147	-4.8	0.35	3.63	0.78	1.00	1.99	4
26BL	2	90	4	WET	16	274	0.38	243	8.4	51	5	29	40	-2.5	161	-4.8	0.58	4.00	0.56	2.00	2.32	2
26BU	2	90	4	WET	15	273	0.28	179	8.4	48	4	11	12	-2.5	168	-4.8	0.35	3.00	0.44	3.00	1.99	6
27AL	2	90	4	WET	912	172	2.00	1280	9.1	26	2	460	170	500.0	312	14.0	11.00	15.63	5.31	-2.50	1.66	10
27AU	2	90	4	WET	911	171	0.86	550	9.2	24	4	200	70	71.0	289	7.0	4.60	11.88	2.00	-2.50	1.99	14
27BL	2	90	4	WET	914	174	1.00	640	9.6	29	12	260	33	-2.5	252	52.0	12.00	5.25	2.31	-2.50	1.33	16
27BU	2	90	4	WET	913	173	0.76	486	9.3	26	8	180	26	4.0	348	19.0	4.40	5.63	2.69	-2.50	2.32	14
28AL	2	90	4	WET	984	240	0.80	512	8.9	25	3	200	70	114.0	270	-4.8	1.10	8.13	1.77	1.07	0.66	4
28AU	2	90	4	WET	983	239	0.50	320	9.0	23	3	116	20	31.0	303	5.0	2.00	5.50	1.77	1.43	1.66	8
28BL	2	90	4	WET	986	242	0.88	563	8.8	29	3	218	80	125.0	241	-4.8	1.10	8.13	1.46	0.36	1.33	6
28BU	2	90	4	WET	985	241	0.52	333	9.1	25	5	106	16	-2.5	312	5.0	2.15	2.88	1.38	-2.50	1.33	8
30AL	2	90	4	WET	972	228	1.60	1024	8.5	39	7	345	252	227.0	265	-4.8	5.20	9.38	2.15	0.71	0.99	8
30AU	2	90	4	WET	971	227	1.60	1024	8.4	54	9	345	248	247.0	275	-4.8	5.00	13.12	1.85	1.43	1.33	14
30BL	2	90	4	WET	974	230	1.80	1152	8.4	49	8	364	316	228.0	244	2.0	4.70	7.50	1.92	1.07	0.66	10
30BU	2	90	4	WET	973	229	1.50	960	8.4	41	7	345	262	218.0	263	2.0	5.40	8.75	2.00	0.71	1.33	10
31AL	2	90	4	WET	18	276	1.10	704	9.1	23	3	218	136	86.0	289	9.0	7.40	14.38	2.44	0.50	1.66	4
31AU	2	90	4	WET	17	275	1.20	768	9.1	23	4	255	100	125.0	312	9.0	0.48	25.00	3.89	1.50	2.65	8
31BL	2	90	4	WET	20	278	1.30	832	9.0	23	2	291	180	120.0	275	9.0	9.60	9.38	2.89	-2.50	0.66	4
31BU	2	90	4	WET	19	277	1.10	704	9.2	25	3	273	124	144.0	303	7.0	8.00	10.63	4.33	1.00	1.33	6
32AL	2	90	4	WET	22	280	1.50	960	9.0	23	2	309	172	144.0	265	9.0	9.60	19.38	3.00	1.00	0.66	2
32AU	2	90	4	WET	21	279	1.30	832	9.1	24	4	255	124	99.0	284	5.0	5.20	27.50	4.00	0.50	1.66	6
32BL	2	90	4	WET	24	282	1.60	1024	9.0	24	2	382	228	190.0	260	9.0	11.00	25.00	4.11	2.00	0.66	2
32BU	2	90	4	WET	23	281	2.00	1280	9.0	26	2	455	232	310.0	279	5.0	10.00	42.50	5.22	3.00	1.33	4
33AL	2	90	4	WET	26	284	0.18	115	8.4	38	4	6	14	-2.5	123	-4.8	0.20	2.63	1.33	-2.50	3.98	6
33AU	2	90	4	WET	25	283	0.18	115	8.3	37	4	6	14	-2.5	118	-4.8	0.19	3.25	1.56	-2.50	7.62	6
33BL	2	90	4	WET	28	286	0.18	115	8.5	38	4	8	14	-2.5	128	-4.8	0.19	2.06	1.78	-2.50	2.98	6
33BU	2	90	4	WET	27	285	0.18	115	8.3	37	4	6	14	6.0	116	-4.8	0.14	2.44	1.89	1.25	8.62	8
34AL	2	90	4	WET	988	244	0.40	256	8.6	27	2	45	56	15.0	144	-4.8	0.19	3.00	0.25	2.50	0.33	4
34AU	2	90	4	WET	987	243	0.26	166	8.5	46	4	8	16	11.0	137	-4.8	0.18	2.75	0.15	1.25	0.66	6
34BL	2	90	4	WET	990	246	0.28	179	8.4	55	5	8	16	12.0	168	-4.8	0.21	2.75	0.30	2.50	0.99	8
34BU	2	90	4	WET	989	245	0.26	166	8.5	51	4	6	12	16.0	154	-4.8	0.19	2.50	0.30	1.25	1.99	10

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Site	Qr	Yr	Mn	Sea	Id Num	Lab Num	EC x 1000	Solu Salts ppm	pH	Ca ppm	Mg ppm	Na ppm	Cl ppm	SO4 ppm	HCO3 ppm	CO3 ppm	F ppm	NO3-N ppm	Boron ppm	NH4 ppm	PO4-P ppm	k ppm
35AL	2	90	4	WET	992	248	0.20	128	8.6	39	3	6	12	-2.5	109	-4.8	0.16	2.63	0.40	-2.50	2.98	6
35AU	2	90	4	WET	991	247	0.18	115	8.8	32	3	4	10	2.0	85	-4.8	0.12	2.13	0.10	-2.50	4.64	8
35BL	2	90	4	WET	994	250	0.18	115	8.8	33	3	4	14	2.0	97	-4.8	0.14	2.31	0.15	-2.50	3.65	6
35BU	2	90	4	WET	993	249	0.18	115	8.7	33	3	4	10	-2.5	99	-4.8	0.12	2.25	0.10	-2.50	4.64	6
36AL	2	90	4	WET	996	252	1.10	704	8.3	79	6	171	138	150.0	144	-4.8	0.60	13.75	0.70	-2.50	0.33	6
36AU	2	90	4	WET	995	251	0.28	179	8.5	41	4	15	20	8.0	151	-4.8	0.13	2.63	0.10	-2.50	0.66	8
36BL	2	90	4	WET	998	254	0.36	230	8.7	28	2	65	18	-2.5	199	2.0	0.42	2.63	0.30	2.50	0.33	2
36BU	2	90	4	WET	997	253	0.28	179	8.4	48	4	11	20	-2.5	156	-4.8	0.21	2.75	0.20	3.75	0.66	8
37AL	2	90	4	WET	1000	256	0.32	205	8.4	61	4	11	12	2.0	170	-4.8	0.23	4.88	0.50	-2.50	0.99	2
37AU	2	90	4	WET	999	255	0.24	154	8.4	56	3	6	16	-2.5	170	-4.8	0.21	2.44	0.20	-2.50	1.66	4
37BL	2	90	4	WET	1002	258	0.28	179	8.4	46	4	11	14	-2.5	161	-4.8	0.23	4.00	0.75	-2.50	0.66	2
37BU	2	90	4	WET	1001	257	0.26	166	8.4	60	4	6	14	-2.5	178	-4.8	0.20	2.50	0.40	1.25	1.33	8
38AL	2	90	4	WET	54	312	1.30	832	9.0	15	2	300	120	95.0	386	42.0	1.40	10.63	1.79	3.75	2.32	2
38AU	2	90	4	WET	53	311	0.56	358	8.9	19	3	130	28	41.0	279	19.0	0.28	4.75	0.50	3.75	2.65	4
38BL	2	90	4	WET	56	314	1.10	704	9.1	17	2	240	98	77.0	350	40.0	0.50	10.63	1.07	2.50	1.99	2
38BU	2	90	4	WET	55	313	0.40	256	8.6	21	3	100	20	10.0	289	5.0	0.29	4.75	0.64	7.81	2.65	6
39AL	2	90	4	WET	58	316	2.70	1728	8.5	34	5	560	558	276.0	208	2.0	0.54	15.00	2.50	1.25	1.99	6
39AU	2	90	4	WET	57	315	0.94	602	8.3	38	4	180	208	16.0	192	2.0	0.24	7.50	0.50	3.75	1.66	8
39BL	2	90	4	WET	60	318	2.70	1728	8.5	38	7	580	616	249.0	208	5.0	1.00	18.13	4.64	3.75	0.99	6
39BU	2	90	4	WET	59	317	0.56	358	8.5	29	3	96	56	16.0	232	2.0	0.21	4.50	0.93	2.50	1.66	8
40AL	2	90	4	WET	924	184	0.32	205	8.6	43	4	26	16	46.0	147	-4.8	0.20	3.75	0.57	-2.50	2.32	10
40AU	2	90	4	WET	923	183	0.32	205	8.5	39	5	32	16	-2.5	185	-4.8	0.20	3.50	0.86	1.25	2.32	14
40BL	2	90	4	WET	926	186	0.40	256	8.4	58	5	54	20	90.0	142	-4.8	0.18	6.25	0.64	-2.50	2.65	50
40BU	2	90	4	WET	925	185	0.34	218	8.7	46	4	20	14	-2.5	180	-4.8	0.16	3.38	0.96	-2.50	2.65	24
41AL	2	90	4	WET	10	268	1.80	1152	9.0	21	2	364	344	112.0	241	9.0	1.20	15.63	9.11	1.00	0.33	6
41AU	2	90	4	WET	9	267	0.70	448	8.5	38	4	91	116	18.0	168	-4.8	0.29	6.00	1.00	1.00	0.66	6
41BL	2	90	4	WET	12	270	2.20	1408	8.9	24	3	509	562	112.0	194	14.0	1.60	16.88	9.33	2.00	0.33	4
41BU	2	90	4	WET	11	269	0.52	333	8.6	36	3	71	76	13.0	170	-4.8	0.32	5.25	1.22	2.00	0.33	6
42AL	2	90	4	WET	50	308	0.40	256	8.1	66	5	20	32	25.0	204	-4.8	0.26	5.00	0.57	5.00	1.99	11
42AU	2	90	4	WET	49	307	0.32	205	8.2	59	4	10	16	-2.5	206	-4.8	0.30	2.88	0.50	3.75	2.32	15
42BL	2	90	4	WET	52	310	0.28	179	8.2	62	4	10	16	-2.5	189	-4.8	0.21	3.25	0.50	3.75	1.33	4
42BU	2	90	4	WET	51	309	0.24	154	8.2	62	4	8	18	-2.5	185	-4.8	0.20	2.88	0.46	3.75	1.33	6
43AL	2	90	4	WET	46	304	1.60	1024	8.4	62	12	280	220	299.0	388	-4.8	1.40	5.75	1.50	6.41	4.97	17
43AU	2	90	4	WET	45	303	1.60	1024	8.2	66	18	300	284	279.0	369	-4.8	1.70	11.25	1.71	8.75	5.64	13
43BL	2	90	4	WET	48	306	1.60	1024	8.4	68	14	300	246	336.0	376	-4.8	1.60	6.25	1.57	5.94	3.98	15
43BU	2	90	4	WET	47	305	1.60	1024	8.3	60	15	300	270	296.0	367	-4.8	1.60	9.38	2.43	5.94	5.30	17
44AL	2	90	4	WET	928	188	0.48	307	9.1	22	4	76	24	27.0	241	9.0	0.25	3.38	1.57	-2.50	3.32	56
44AU	2	90	4	WET	927	187	0.40	256	8.7	35	5	30	24	22.0	180	-4.8	0.12	5.38	0.64	-2.50	3.98	48
44BL	2	90	4	WET	930	190	0.92	589	8.6	35	7	110	146	26.0	156	-4.8	0.25	18.13	0.93	-2.50	3.98	72
44BU	2	90	4	WET	929	189	0.36	230	8.7	31	5	24	20	-2.5	185	-4.8	0.17	3.13	0.71	-2.50	2.98	48
45AL	2	90	4	WET	976	232	1.30	832	9.3	17	2	327	120	140.0	364	28.0	8.20	15.63	2.54	0.71	0.99	2
45AU	2	90	4	WET	975	231	0.80	512	9.4	23	2	236	30	3.0	407	33.0	4.40	5.63	1.85	0.71	1.33	4
45BL	2	90	4	WET	978	234	1.20	768	9.5	14	10	309	62	90.0	398	37.0	7.60	13.75	4.08	0.71	0.99	2
45BU	2	90	4	WET	977	233	0.76	486	9.4	17	2	255	28	-2.5	454	28.0	4.40	5.63	3.08	0.71	1.33	6

Raw Soil S[illegible] Data

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Site	Qtr	Yr	Mn	Sea	Id Num	Lab Num	Na exchg Meq/ 100gm	K exchg Meq/ 100gm	Ca exchg Meq/ 100gm	Mg exchg Meq/ 100gm	Total P ppm
01AL	2	90	4	WET	888	148	0.82	0.59	35.43	1.81	9999.99
01AU	2	90	4	WET	887	147	0.55	0.85	34.93	2.14	9999.99
01BL	2	90	4	WET	890	150	1.65	0.61	39.17	1.95	9999.99
01BU	2	90	4	WET	889	149	1.14	0.83	35.68	1.89	9999.99
02AL	2	90	4	WET	896	156	0.60	1.71	31.94	3.35	9999.99
02AU	2	90	4	WET	895	155	2.20	1.02	29.19	3.00	9999.99
02BL	2	90	4	WET	898	158	2.11	1.39	30.19	3.45	9999.99
02BU	2	90	4	WET	897	157	0.64	1.61	30.56	3.53	9999.99
03AL	2	90	4	WET	948	204	18.23	1.24	20.35	2.30	9999.99
03AU	2	90	4	WET	947	203	7.46	1.29	23.27	2.14	9999.99
03BL	2	90	4	WET	950	206	20.71	1.24	22.01	2.28	9999.99
03BU	2	90	4	WET	949	205	12.61	1.46	23.27	2.03	9999.99
04AL	2	90	4	WET	916	176	0.27	0.86	29.07	1.36	9999.99
04AU	2	90	4	WET	915	175	0.27	0.86	29.82	1.42	9999.99
04BL	2	90	4	WET	918	178	0.50	0.92	31.06	1.50	9999.99
04BU	2	90	4	WET	917	177	0.27	0.89	29.32	1.42	9999.99
05AL	2	90	4	WET	904	164	1.28	0.67	24.83	1.75	9999.99
05AU	2	90	4	WET	903	163	1.14	0.84	24.38	1.77	9999.99
05BL	2	90	4	WET	906	166	2.29	0.65	23.75	1.52	9999.99
05BU	2	90	4	WET	905	165	0.87	0.92	23.69	1.75	9999.99
06AL	2	90	4	WET	908	168	0.41	0.46	32.56	1.64	9999.99
06AU	2	90	4	WET	907	167	0.32	0.65	32.31	1.81	9999.99
06BL	2	90	4	WET	910	170	0.82	0.44	32.56	1.69	9999.99
06BU	2	90	4	WET	909	169	0.27	0.54	29.82	1.64	9999.99
07AL	2	90	4	WET	2	260	1.35	0.49	24.14	3.31	9999.99
07AU	2	90	4	WET	1	259	1.13	0.71	24.03	3.35	9999.99
07BL	2	90	4	WET	4	262	1.87	0.49	22.87	3.58	9999.99
07BU	2	90	4	WET	3	261	1.57	0.54	24.00	3.56	9999.99
08AL	2	90	4	WET	940	196	5.49	1.02	19.64	1.29	9999.99
08AU	2	90	4	WET	939	195	1.92	1.38	22.23	1.75	9999.99
08BL	2	90	4	WET	942	198	1.24	0.44	19.62	1.23	9999.99
08BU	2	90	4	WET	941	197	0.50	0.46	20.03	1.25	9999.99
09AL	2	90	4	WET	900	160	0.41	1.58	27.57	2.98	9999.99
09AU	2	90	4	WET	899	159	0.46	1.58	30.56	3.10	9999.99
09BL	2	90	4	WET	902	162	0.55	1.88	27.07	2.94	9999.99
09BU	2	90	4	WET	901	161	0.41	1.46	29.07	2.84	9999.99
10AL	2	90	4	WET	892	152	0.37	0.61	27.94	1.91	9999.99
10AU	2	90	4	WET	891	151	0.27	0.61	27.20	1.71	9999.99
10BL	2	90	4	WET	894	154	0.50	0.56	25.57	1.81	9999.99
10BU	2	90	4	WET	893	153	0.37	0.61	25.45	1.73	9999.99
11AL	2	90	4	WET	944	200	3.21	2.56	27.94	2.51	9999.99
11AU	2	90	4	WET	943	199	3.02	2.56	28.69	2.47	9999.99
11BL	2	90	4	WET	946	202	2.98	2.56	28.32	2.51	9999.99
11BU	2	90	4	WET	945	201	2.98	2.56	28.32	2.55	9999.99

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Site	Qtr	Yr	Mn	Sea	Id Num	Lab Num	Na exchg Meq/ 100gm	K exchg Meq/ 100gm	Ca exchg Meq/ 100gm	Mg exchg Meq/ 100gm	Total P ppm
12AL	2	90	4	WET	932	192	5.04	2.56	23.75	1.54	9999.99
12AU	2	90	4	WET	931	191	4.12	2.30	24.08	1.52	9999.99
12BL	2	90	4	WET	934	194	5.04	2.30	22.70	1.52	9999.99
12BU	2	90	4	WET	933	193	3.34	2.30	22.45	1.36	9999.99
13AL	2	90	4	WET	936	332	1.74	1.24	22.62	1.81	9999.99
13AU	2	90	4	WET	935	331	1.91	1.10	22.55	1.69	9999.99
13BL	2	90	4	WET	938	334	1.87	1.19	22.47	1.81	9999.99
13BU	2	90	4	WET	937	333	2.00	1.08	22.43	1.71	9999.99
14AL	2	90	4	WET	884	144	1.42	3.58	29.44	3.16	9999.99
14AU	2	90	4	WET	883	143	0.78	5.85	29.19	3.93	9999.99
14BL	2	90	4	WET	886	146	1.37	3.33	27.20	2.88	9999.99
14BU	2	90	4	WET	885	145	1.01	5.61	28.44	3.53	9999.99
15AL	2	90	4	WET	960	216	0.25	0.79	23.88	1.15	9999.99
15AU	2	90	4	WET	959	215	0.17	1.00	24.46	1.25	9999.99
15BL	2	90	4	WET	962	218	0.21	0.87	23.50	1.25	9999.99
15BU	2	90	4	WET	961	217	0.21	0.95	26.20	1.25	9999.99
16AL	2	90	4	WET	952	208	18.23	1.32	22.62	2.67	9999.99
16AU	2	90	4	WET	951	207	7.46	1.32	21.63	1.77	9999.99
16BL	2	90	4	WET	954	210	19.47	1.61	22.58	2.53	9999.99
16BU	2	90	4	WET	953	209	5.39	1.24	21.00	1.52	9999.99
17AL	2	90	4	WET	980	236	0.38	5.39	29.07	4.15	9999.99
17AU	2	90	4	WET	979	235	0.38	3.77	24.80	2.88	9999.99
17BL	2	90	4	WET	982	238	0.34	4.58	24.14	3.93	9999.99
17BU	2	90	4	WET	981	237	0.34	3.77	29.07	4.19	9999.99
18AL	2	90	4	WET	62	320	0.30	0.59	28.57	1.64	9999.99
18AU	2	90	4	WET	61	319	0.26	0.81	28.69	1.73	9999.99
18BL	2	90	4	WET	64	322	0.30	0.62	29.44	1.85	9999.99
18BU	2	90	4	WET	63	321	0.39	0.75	24.40	1.36	9999.99
19AL	2	90	4	WET	66	324	0.74	6.47	21.97	2.26	9999.99
19AU	2	90	4	WET	65	323	0.57	2.82	22.52	1.87	9999.99
19BL	2	90	4	WET	68	326	0.52	3.58	22.42	1.91	9999.99
19BU	2	90	4	WET	67	325	0.35	4.61	22.39	2.16	9999.99
20AL	2	90	4	WET	70	328	2.00	1.56	20.37	2.24	9999.99
20AU	2	90	4	WET	69	327	0.83	1.51	19.45	1.83	9999.99
20BL	2	90	4	WET	72	330	2.44	1.79	21.27	2.36	9999.99
20BU	2	90	4	WET	71	329	1.09	1.84	20.78	2.22	9999.99
21AL	2	90	4	WET	30	288	4.35	1.54	21.73	1.99	9999.99
21AU	2	90	4	WET	29	287	0.91	1.24	23.94	2.30	9999.99
21BL	2	90	4	WET	32	290	2.74	1.54	21.54	1.93	9999.99
21BU	2	90	4	WET	31	289	0.57	0.97	24.15	2.49	9999.99
22AL	2	90	4	WET	34	292	0.22	0.38	24.43	0.95	9999.99
22AU	2	90	4	WET	33	291	0.22	0.51	23.18	0.95	9999.99
22BL	2	90	4	WET	36	294	0.26	0.38	24.16	0.95	9999.99
22BU	2	90	4	WET	35	293	0.17	0.41	22.90	0.88	9999.99

Raw Soil Data

For Quarter 2/90

Site	Qtr	Yr	Mn	Sea	Id Num	Lab Num	Na exchg Meq/ 100gm	K exchg Meq/ 100gm	Ca exchg Meq/ 100gm	Mg exchg Meq/ 100gm	Total P ppm
23AL	2	90	4	WET	968	224	3.31	1.18	27.44	2.47	9999.99
23AU	2	90	4	WET	967	223	5.30	1.13	27.07	2.57	9999.99
23BL	2	90	4	WET	970	226	3.48	1.28	27.69	2.61	9999.99
23BU	2	90	4	WET	969	225	5.30	1.31	27.69	2.63	9999.99
24AL	2	90	4	WET	956	212	2.28	1.79	24.79	2.14	9999.99
24AU	2	90	4	WET	955	211	1.70	1.97	24.08	1.97	9999.99
24BL	2	90	4	WET	958	214	2.49	1.61	27.82	2.49	9999.99
24BU	2	90	4	WET	957	213	1.65	2.56	23.79	2.06	9999.99
25AL	2	90	4	WET	920	180	1.74	1.32	27.82	3.49	9999.99
25AU	2	90	4	WET	919	179	1.65	1.73	28.32	3.90	9999.99
25BL	2	90	4	WET	922	182	1.92	1.61	30.81	4.44	9999.99
25BU	2	90	4	WET	921	181	1.83	1.58	29.44	4.09	9999.99
26AL	2	90	4	WET	14	272	0.44	0.51	29.32	1.42	9999.99
26AU	2	90	4	WET	13	271	0.28	0.56	27.07	1.09	9999.99
26BL	2	90	4	WET	16	274	0.51	0.38	27.44	1.32	9999.99
26BU	2	90	4	WET	15	273	0.32	0.61	23.49	1.05	9999.99
27AL	2	90	4	WET	912	172	5.49	0.86	22.67	1.17	9999.99
27AU	2	90	4	WET	911	171	2.47	1.13	22.92	1.25	9999.99
27BL	2	90	4	WET	914	174	4.58	0.94	22.14	1.19	9999.99
27BU	2	90	4	WET	913	173	2.43	1.08	23.10	1.29	9999.99
28AL	2	90	4	WET	984	240	4.92	0.92	29.94	1.89	9999.99
28AU	2	90	4	WET	983	239	2.04	1.23	29.32	1.66	9999.99
28BL	2	90	4	WET	986	242	2.91	1.20	32.68	1.83	9999.99
28BU	2	90	4	WET	985	241	2.31	1.25	28.82	1.81	9999.99
30AL	2	90	4	WET	972	228	6.05	1.25	29.32	3.29	9999.99
30AU	2	90	4	WET	971	227	5.67	1.41	30.19	3.45	9999.99
30BL	2	90	4	WET	974	230	5.67	1.18	28.07	3.10	9999.99
30BU	2	90	4	WET	973	229	5.67	1.31	28.69	3.21	9999.99
31AL	2	90	4	WET	18	276	2.03	0.38	21.61	0.92	9999.99
31AU	2	90	4	WET	17	275	2.61	0.56	21.02	1.21	9999.99
31BL	2	90	4	WET	20	278	2.49	0.41	21.74	0.95	9999.99
31BU	2	90	4	WET	19	277	2.57	0.51	21.27	1.01	9999.99
32AL	2	90	4	WET	22	280	2.57	0.26	22.37	1.11	9999.99
32AU	2	90	4	WET	21	279	2.24	0.44	22.03	1.23	9999.99
32BL	2	90	4	WET	24	282	2.94	0.26	21.63	1.05	9999.99
32BU	2	90	4	WET	23	281	3.95	0.38	21.18	1.13	9999.99
33AL	2	90	4	WET	26	284	0.17	0.15	6.21	0.41	9999.99
33AU	2	90	4	WET	25	283	0.13	0.18	5.48	0.41	9999.99
33BL	2	90	4	WET	28	286	0.13	0.20	10.95	0.55	9999.99
33BU	2	90	4	WET	27	285	0.13	0.18	5.39	0.45	9999.99
34AL	2	90	4	WET	988	244	0.50	0.44	26.20	0.97	9999.99
34AU	2	90	4	WET	987	243	0.21	0.59	26.82	1.21	9999.99
34BL	2	90	4	WET	990	246	0.21	0.49	23.96	1.03	9999.99
34BU	2	90	4	WET	989	245	0.21	0.61	24.38	1.11	9999.99

Raw Soil Sample Data

For Quarter 2/90

Site	Qtr	Yr	Mn	Sea	Id Num	Lab Num	Na exchg Meq/ 100gm	K exchg Meq/ 100gm	Ca exchg Meq/ 100gm	Mg exchg Meq/ 100gm	Total P ppm
35AL	2	90	4	WET	992	248	0.17	0.28	14.77	0.66	9999.99
35AU	2	90	4	WET	991	247	0.17	0.28	11.65	0.49	9999.99
35BL	2	90	4	WET	994	250	0.17	0.28	12.29	0.58	9999.99
35BU	2	90	4	WET	993	249	0.12	0.26	11.96	0.53	9999.99
36AL	2	90	4	WET	996	252	1.44	0.59	30.56	1.85	9999.99
36AU	2	90	4	WET	995	251	0.29	1.02	32.81	2.55	9999.99
36BL	2	90	4	WET	998	254	0.87	0.54	30.31	1.64	9999.99
36BU	2	90	4	WET	997	253	0.29	1.10	32.93	2.51	9999.99
37AL	2	90	4	WET	1000	256	0.21	0.31	28.44	0.95	9999.99
37AU	2	90	4	WET	999	255	0.17	0.41	26.82	0.97	9999.99
37BL	2	90	4	WET	1002	258	0.21	0.26	27.44	1.09	9999.99
37BU	2	90	4	WET	1001	257	0.17	0.54	27.44	1.17	9999.99
38AL	2	90	4	WET	54	312	9.57	0.40	34.18	3.82	9999.99
38AU	2	90	4	WET	53	311	3.22	0.62	35.18	3.33	9999.99
38BL	2	90	4	WET	56	314	7.83	0.51	32.56	3.41	9999.99
38BU	2	90	4	WET	55	313	2.11	0.65	36.43	3.53	9999.99
39AL	2	90	4	WET	58	316	6.09	0.40	27.20	3.08	9999.99
39AU	2	90	4	WET	57	315	2.01	0.62	30.56	2.67	9999.99
39BL	2	90	4	WET	60	318	5.65	0.35	25.82	3.12	9999.99
39BU	2	90	4	WET	59	317	1.30	0.81	29.94	2.49	9999.99
40AL	2	90	4	WET	924	184	0.64	1.10	25.07	1.66	9999.99
40AU	2	90	4	WET	923	183	0.60	1.25	28.19	2.26	9999.99
40BL	2	90	4	WET	926	186	0.46	1.13	24.50	1.54	9999.99
40BU	2	90	4	WET	925	185	0.46	1.74	19.06	1.07	9999.99
41AL	2	90	4	WET	10	268	3.56	0.49	24.43	1.46	9999.99
41AU	2	90	4	WET	9	267	0.99	0.61	27.57	1.52	9999.99
41BL	2	90	4	WET	12	270	4.75	0.36	24.50	1.29	9999.99
41BU	2	90	4	WET	11	269	0.87	0.64	28.19	1.56	9999.99
42AL	2	90	4	WET	50	308	0.30	0.62	26.95	1.21	9999.99
42AU	2	90	4	WET	49	307	0.22	0.70	25.70	1.07	9999.99
42BL	2	90	4	WET	52	310	0.26	0.30	26.82	1.03	9999.99
42BU	2	90	4	WET	51	309	0.22	0.40	27.32	1.09	9999.99
43AL	2	90	4	WET	46	304	3.00	1.08	26.20	4.29	9999.99
43AU	2	90	4	WET	45	303	2.74	0.73	23.96	4.38	9999.99
43BL	2	90	4	WET	48	306	2.91	0.92	25.57	4.03	9999.99
43BU	2	90	4	WET	47	305	2.96	0.94	24.76	4.46	9999.99
44AL	2	90	4	WET	928	188	1.97	6.91	23.99	2.86	9999.99
44AU	2	90	4	WET	927	187	0.50	4.10	23.94	2.34	9999.99
44BL	2	90	4	WET	930	190	1.79	5.63	24.44	3.04	9999.99
44BU	2	90	4	WET	929	189	0.55	4.61	24.34	2.59	9999.99
45AL	2	90	4	WET	976	232	7.19	0.65	23.79	2.26	9999.99
45AU	2	90	4	WET	975	231	5.30	0.65	23.55	2.12	9999.99
45BL	2	90	4	WET	978	234	7.19	0.62	23.25	1.89	9999.99
45BU	2	90	4	WET	977	233	6.05	0.81	23.53	2.08	9999.99

Raw Soil S[illegible]ata

For Quarter 3/90

Site	Qr	Yr	Mn	Sea	Id Num	Lab Num	EC x 1000	Solu Salts ppm	pH	Ca ppm	Mg ppm	Na ppm	Cl ppm	SO4 ppm	HCO3 ppm	CO3 ppm	F ppm	NO3-N ppm	Boron ppm	NH4 ppm	PO4-P ppm	k ppm
01AL	3	90	7	DRY	90	486	6.80	4352	7.8	968	54	420	1250	138.0	62	-4.8	0.27	300.00	1.00	2.50	-0.30	13
01AU	3	90	7	DRY	89	485	4.80	3072	7.8	810	46	260	870	42.0	71	-4.8	0.18	243.75	0.73	5.00	-0.30	23
01BL	3	90	7	DRY	92	488	3.60	2304	7.9	538	31	180	564	84.0	76	-4.8	0.20	210.00	0.73	2.50	1.39	19
01BU	3	90	7	DRY	91	487	1.30	832	8.2	155	11	64	186	15.0	92	-4.8	0.17	60.00	0.60	2.50	0.35	13
02AL	3	90	7	DRY	94	490	1.80	1152	9.0	26	4	360	372	67.0	222	5.0	0.58	20.63	1.60	-2.50	3.48	20
02AU	3	90	7	DRY	93	489	0.36	230	8.7	39	6	32	14	13.0	180	-4.8	0.27	5.63	0.73	1.25	3.13	28
02BL	3	90	7	DRY	96	492	0.80	512	8.8	30	5	136	104	8.0	213	2.0	0.48	13.12	0.93	-2.50	1.74	18
02BU	3	90	7	DRY	95	491	0.36	230	8.7	38	6	38	14	18.0	182	-4.8	0.27	5.25	0.93	-2.50	2.44	24
03AL	3	90	7	DRY	74	470	14.00	8960	8.7	200	26	3400	3420	1040.0	142	-4.8	8.40	160.00	43.33	1.25	1.04	34
03AU	3	90	7	DRY	73	469	6.00	3840	8.8	60	7	1300	1540	183.0	187	9.0	2.60	65.00	17.33	2.50	1.39	29
03BL	3	90	7	DRY	76	472	10.00	6400	8.8	93	13	2400	2420	640.0	161	5.0	10.00	120.00	47.33	1.25	1.04	29
03BU	3	90	7	DRY	75	471	2.20	1408	9.0	52	5	480	492	-2.5	211	9.0	2.70	30.00	2.67	2.50	1.74	51
04AL	3	90	7	DRY	106	502	0.32	205	8.4	56	4	12	12	13.0	161	-4.8	0.31	3.88	0.80	-2.50	0.70	10
04AU	3	90	7	DRY	105	501	0.34	218	8.4	58	5	12	8	8.0	170	-4.8	0.28	7.50	0.60	1.25	0.35	14
04BL	3	90	7	DRY	108	504	0.76	486	8.3	87	7	58	156	41.0	140	-4.8	0.25	14.38	0.60	-2.50	1.04	20
04BU	3	90	7	DRY	107	503	0.32	205	8.5	56	5	14	16	15.0	156	-4.8	0.33	5.13	0.53	-2.50	0.70	14
05AL	3	90	7	DRY	110	506	0.56	358	8.7	35	4	148	104	-2.5	211	-4.8	6.40	13.75	1.33	-2.50	1.39	16
05AU	3	90	7	DRY	109	505	0.56	358	8.5	55	6	58	44	19.0	189	-4.8	2.30	13.75	1.20	-2.50	1.74	22
05BL	3	90	7	DRY	112	508	0.96	614	8.7	40	4	180	128	38.0	213	-4.8	4.60	26.25	1.73	-2.50	1.74	20
05BU	3	90	7	DRY	111	507	0.48	307	8.6	42	5	64	40	-2.5	185	-4.8	2.70	13.12	1.00	-2.50	2.09	26
06AL	3	90	7	DRY	102	498	2.90	1856	8.4	80	5	540	610	240.0	147	-4.8	0.30	30.00	4.67	-2.50	0.70	4
06AU	3	90	7	DRY	101	497	0.72	461	8.8	32	4	134	92	-2.5	211	-4.8	0.30	13.12	1.40	-2.50	1.39	10
06BL	3	90	7	DRY	104	500	0.36	230	8.5	52	4	34	14	-2.5	192	-4.8	0.33	6.25	0.93	1.25	0.70	2
06BU	3	90	7	DRY	103	499	0.32	205	8.5	47	4	22	6	-2.5	163	-4.8	0.25	5.63	0.87	1.25	1.04	6
07AL	3	90	7	DRY	142	538	1.10	704	9.0	23	4	240	132	106.0	246	9.0	4.00	16.25	2.33	1.00	1.74	8
07AU	3	90	7	DRY	141	537	0.60	384	9.0	23	3	132	40	28.0	249	9.0	2.80	12.50	2.13	1.00	3.13	8
07BL	3	90	7	DRY	144	540	0.60	384	8.8	28	5	99	34	36.0	225	-4.8	2.60	14.38	1.07	1.00	3.13	12
07BU	3	90	7	DRY	143	539	0.56	358	8.7	30	6	86	28	28.0	232	-4.8	2.10	18.13	1.00	3.00	3.13	20
08AL	3	90	7	DRY	150	546	2.00	1280	9.2	26	4	440	462	140.0	170	9.0	0.82	13.75	4.00	-2.50	2.44	14
08AU	3	90	7	DRY	149	545	0.36	230	8.8	35	5	36	32	-2.5	147	-4.8	0.37	6.13	0.40	1.00	3.13	16
08BL	3	90	7	DRY	152	548	1.40	896	9.3	22	3	300	294	52.0	170	12.0	0.70	13.12	0.80	-2.50	2.09	10
08BU	3	90	7	DRY	151	547	0.72	461	9.1	24	5	132	112	2.0	170	19.0	0.50	9.38	0.73	-2.50	2.78	18
09AL	3	90	7	DRY	98	494	0.64	410	8.5	47	9	62	84	20.0	168	-4.8	0.27	17.50	0.80	-2.50	2.44	44
09AU	3	90	7	DRY	97	493	0.36	230	8.5	52	7	20	12	9.0	204	-4.8	0.28	6.88	1.00	3.75	1.74	26
09BL	3	90	7	DRY	100	496	0.68	435	8.5	50	10	58	92	12.0	173	-4.8	0.21	13.75	0.73	1.25	2.44	42
09BU	3	90	7	DRY	99	495	0.40	256	8.6	48	7	28	8	-2.5	199	-4.8	0.26	8.13	0.93	1.25	2.78	28
10AL	3	90	7	DRY	82	478	0.48	307	8.5	58	7	38	40	22.0	118	-4.8	0.68	14.38	0.60	1.25	0.35	10
10AU	3	90	7	DRY	81	477	0.32	205	8.5	55	5	12	38	-2.5	135	-4.8	0.52	6.88	0.60	1.25	0.70	11
10BL	3	90	7	DRY	84	480	0.52	333	8.5	58	6	44	54	20.0	140	-4.8	0.66	10.00	0.67	1.25	0.35	13
10BU	3	90	7	DRY	83	479	0.28	179	8.6	55	5	8	6	7.0	151	-4.8	0.50	5.63	0.53	1.25	0.70	17
11AL	3	90	7	DRY	154	550	2.20	1408	8.5	40	4	440	360	221.0	284	7.0	13.00	16.88	3.50	2.00	1.74	36
11AU	3	90	7	DRY	153	549	1.90	1216	8.5	43	6	380	320	213.0	322	19.0	13.00	16.25	3.29	3.00	1.04	34
11BL	3	90	7	DRY	156	552	2.20	1408	8.5	45	5	440	352	244.0	246	9.0	12.00	26.25	3.79	3.00	1.04	36
11BU	3	90	7	DRY	155	551	2.40	1536	8.4	48	5	460	386	251.0	222	9.0	12.50	30.00	3.79	3.00	1.39	38

Raw Soil Sample Data

For Quarter 3/90

Site	Qr	Yr	Mn	Sea	Id Num	Lab Num	EC x 1000	Solu Salts ppm	pH	Ca ppm	Mg ppm	Na ppm	Cl ppm	SO4 ppm	HCO3 ppm	CO3 ppm	F ppm	NO3-N ppm	Boron ppm	NH4 ppm	PO4-P ppm	k ppm
12AL	3	90	7	DRY	182	578	2.70	1728	8.3	76	8	463	496	218.0	213	2.0	6.40	80.00	2.85	3.00	2.78	78
12AU	3	90	7	DRY	181	577	2.20	1408	8.4	74	8	180	380	136.0	211	-4.8	3.70	67.50	4.62	3.00	3.13	78
12BL	3	90	7	DRY	184	580	2.80	1792	8.2	133	13	400	582	167.0	170	-4.8	5.20	77.50	2.38	2.00	2.44	88
12BU	3	90	7	DRY	183	579	2.20	1408	8.3	87	8	320	402	97.0	178	-4.8	5.60	62.50	2.38	1.00	3.13	74
13AL	3	90	7	DRY	186	582	0.60	384	8.6	29	4	138	64	31.0	289	9.0	12.00	3.63	0.92	-2.50	1.04	38
13AU	3	90	7	DRY	185	581	0.72	461	8.8	29	9	132	72	17.0	308	5.0	7.00	3.75	1.00	-2.50	1.74	42
13BL	3	90	7	DRY	188	584	0.72	461	8.6	32	7	116	64	15.0	237	9.0	10.50	2.88	0.77	-2.50	1.04	18
13BU	3	90	7	DRY	187	583	0.76	486	8.8	26	5	130	68	22.0	256	9.0	6.80	3.63	1.00	-2.50	2.09	22
14AL	3	90	7	DRY	86	482	0.76	486	8.5	54	7	76	38	52.0	166	-4.8	0.35	31.25	0.87	1.25	0.70	51
14AU	3	90	7	DRY	85	481	0.72	461	8.5	62	9	42	24	100.0	50	-4.8	0.28	21.88	1.80	3.75	1.74	100
14BL	3	90	7	DRY	88	484	2.40	1536	8.2	176	29	180	338	76.0	121	-4.8	0.21	105.00	0.80	2.50	1.04	150
14BU	3	90	7	DRY	87	483	1.60	1024	8.5	53	14	118	78	133.0	211	-4.8	0.21	85.00	1.87	1.25	2.78	229
15AL	3	90	7	DRY	158	554	0.32	205	8.4	47	5	6	14	9.0	137	-4.8	0.42	5.75	0.57	-2.50	1.04	12
15AU	3	90	7	DRY	157	553	0.36	230	8.3	52	5	6	12	9.0	144	-4.8	0.50	6.88	0.64	1.00	1.39	16
15BL	3	90	7	DRY	160	556	0.36	230	8.4	47	5	8	16	17.0	147	-4.8	0.56	7.19	0.79	-2.50	1.39	20
15BU	3	90	7	DRY	159	555	0.30	192	8.4	44	4	4	12	-2.5	144	-4.8	0.30	5.63	0.57	-2.50	1.39	18
16AL	3	90	7	DRY	78	474	12.00	7680	8.9	89	17	3000	2700	500.0	211	-4.8	2.60	362.50	26.67	1.25	1.04	67
16AU	3	90	7	DRY	77	473	3.80	2432	8.9	60	6	760	868	65.0	151	-4.8	0.74	115.00	19.33	1.25	3.13	51
16BL	3	90	7	DRY	80	476	14.00	8960	8.9	91	16	3600	3140	680.0	234	-4.8	2.20	312.50	44.00	-2.50	1.39	120
16BU	3	90	7	DRY	79	475	6.40	4096	8.9	72	8	1380	1640	138.0	142	-4.8	0.58	200.00	13.33	1.25	3.83	93
17AL	3	90	7	DRY	206	602	0.80	512	8.3	82	18	12	12	-2.5	279	-4.8	0.25	38.75	1.71	3.75	5.57	124
17AU	3	90	7	DRY	205	601	0.64	410	8.3	92	15	10	20	-2.5	310	-4.8	0.29	31.25	1.93	7.14	11.83	90
17BL	3	90	7	DRY	208	604	0.48	307	8.6	58	7	32	12	-2.5	230	-4.8	0.20	10.63	1.43	5.00	8.70	66
17BU	3	90	7	DRY	207	603	0.48	307	8.2	75	9	8	12	-2.5	246	-4.8	0.21	13.12	1.21	9.29	10.44	54
18AL	3	90	7	DRY	214	610	0.28	179	8.6	52	5	18	18	-2.5	161	-4.8	0.40	4.13	0.46	1.00	1.39	4
18AU	3	90	7	DRY	213	609	0.28	179	8.5	52	4	22	12	-2.5	161	-4.8	0.26	4.75	0.46	2.00	1.04	14
18BL	3	90	7	DRY	216	612	0.30	192	8.6	54	4	22	18	-2.5	166	-4.8	0.42	3.50	0.62	1.00	0.70	6
18BU	3	90	7	DRY	215	611	0.28	179	8.5	58	5	18	12	-2.5	166	-4.8	0.26	3.88	0.46	2.00	0.70	10
19AL	3	90	7	DRY	210	606	0.48	307	8.5	52	8	20	14	-2.5	251	-4.8	0.40	11.25	1.21	5.00	2.09	74
19AU	3	90	7	DRY	209	605	0.40	256	8.3	55	7	16	16	-2.5	199	-4.8	0.28	12.50	0.71	6.07	2.78	44
19BL	3	90	7	DRY	212	608	0.48	307	8.6	47	7	26	16	-2.5	256	-4.8	0.52	13.75	0.93	3.75	2.09	88
19BU	3	90	7	DRY	211	607	0.44	282	8.4	61	9	18	10	-2.5	237	-4.8	0.29	15.00	0.71	5.00	2.09	60
20AL	3	90	7	DRY	218	614	0.56	358	9.4	25	7	109	12	-2.5	246	23.0	3.70	3.88	1.54	2.00	2.78	28
20AU	3	90	7	DRY	217	613	0.44	282	9.1	26	4	72	16	-2.5	201	5.0	2.50	4.13	0.92	2.00	3.48	32
20BL	3	90	7	DRY	220	616	0.56	358	9.3	19	4	99	30	-2.5	208	23.0	4.40	5.13	1.85	2.00	2.09	24
20BU	3	90	7	DRY	219	615	0.44	282	9.0	31	5	66	16	-2.5	187	5.0	2.30	5.50	1.00	3.00	2.78	32
21AL	3	90	7	DRY	222	618	0.72	461	9.1	21	4	150	120	-2.5	237	5.0	0.34	4.13	0.77	2.00	1.39	24
21AU	3	90	7	DRY	221	617	0.32	205	8.8	30	5	46	20	-2.5	161	2.0	0.44	4.75	0.46	2.00	2.78	16
21BL	3	90	7	DRY	224	620	1.20	768	9.4	18	3	240	216	20.0	222	19.0	0.37	10.00	1.00	3.00	1.04	28
21BU	3	90	7	DRY	223	619	0.36	230	8.9	29	5	54	28	-2.5	187	5.0	0.27	4.50	0.54	3.00	2.44	28
22AL	3	90	7	DRY	226	622	0.24	154	8.7	43	3	18	14	-2.5	125	-4.8	0.35	2.63	0.31	2.00	0.35	6
22AU	3	90	7	DRY	225	621	0.24	154	8.7	45	4	16	20	-2.5	123	-4.8	0.25	3.50	0.23	2.00	0.35	10
22BL	3	90	7	DRY	228	624	0.24	154	8.6	46	4	18	10	-2.5	114	-4.8	0.32	2.13	0.31	2.00	-0.30	6
22BU	3	90	7	DRY	227	623	0.24	154	8.7	43	4	18	16	-2.5	123	-4.8	0.26	3.25	0.23	2.00	0.35	10

Raw Soil Data

For Quarter 3/90

Site	Qr	Yr	Mn	Sea	Id Num	Lab Num	EC x 1000	Solu Salts ppm	pH	Ca ppm	Mg ppm	Na ppm	Cl ppm	SO4 ppm	HCO3 ppm	CO3 ppm	F ppm	NO3-N ppm	Boron ppm	NH4 ppm	PO4-P ppm	k ppm
23AL	3	90	7	DRY	194	590	1.50	960	8.5	58	7	300	248	134.0	267	5.0	8.40	8.44	1.50	6.07	1.04	12
23AU	3	90	7	DRY	193	589	3.00	1920	8.1	110	15	600	600	386.0	208	-4.8	5.60	55.00	1.93	7.14	1.04	20
23BL	3	90	7	DRY	196	592	1.40	896	8.4	58	7	280	244	143.0	265	-4.8	8.00	12.50	1.57	5.00	1.04	14
23BU	3	90	7	DRY	195	591	4.00	2560	8.0	215	26	720	896	404.0	213	-4.8	5.20	65.00	1.86	5.00	1.74	24
24AL	3	90	7	DRY	162	558	0.96	614	8.6	31	4	150	64	37.0	211	12.0	2.80	45.00	1.71	-2.50	2.09	32
24AU	3	90	7	DRY	161	557	0.92	589	8.6	35	5	142	62	-2.5	218	12.0	2.40	38.75	1.50	-2.50	1.74	44
24BL	3	90	7	DRY	164	560	0.80	512	8.7	37	6	180	74	65.0	204	5.0	3.90	37.50	1.50	-2.50	2.09	16
24BU	3	90	7	DRY	163	559	0.88	563	8.6	29	4	120	40	-2.5	237	9.0	2.90	27.50	1.50	-2.50	2.09	38
25AL	3	90	7	DRY	174	570	2.20	1408	8.0	204	36	240	248	491.0	185	-4.8	1.40	77.50	1.23	4.00	2.09	34
25AU	3	90	7	DRY	173	569	1.60	1024	8.1	156	27	142	76	1018.0	253	-4.8	1.30	46.25	1.38	8.21	3.48	50
25BL	3	90	7	DRY	176	572	0.64	410	8.3	58	13	51	26	143.0	251	-4.8	0.98	15.63	1.08	5.00	1.04	24
25BU	3	90	7	DRY	175	571	0.96	614	8.1	84	15	84	44	227.0	206	-4.8	2.20	15.00	0.62	3.00	1.74	24
26AL	3	90	7	DRY	138	534	0.44	282	8.6	35	3	48	44	-2.5	159	-4.8	0.46	3.63	0.47	1.00	0.70	4
26AU	3	90	7	DRY	137	533	0.24	154	8.5	43	4	97	18	-2.5	137	-4.8	0.34	4.50	0.33	3.00	1.04	6
26BL	3	90	7	DRY	140	536	0.44	282	8.5	45	4	18	36	16.0	130	-4.8	0.30	3.13	0.33	-2.50	-0.30	4
26BU	3	90	7	DRY	139	535	0.36	230	8.5	43	4	8	14	-2.5	135	-4.8	0.25	3.00	0.27	1.00	0.70	6
27AL	3	90	7	DRY	114	510	3.60	2304	8.8	43	3	740	504	800.0	234	-4.8	9.20	52.50	8.33	5.00	2.09	14
27AU	3	90	7	DRY	113	509	1.00	640	9.0	25	3	180	232	-2.5	189	23.0	4.40	21.88	2.33	1.25	2.44	12
27BL	3	90	7	DRY	116	512	1.10	704	9.4	26	8	260	128	22.0	350	33.0	13.00	15.63	2.73	-2.50	1.39	16
27BU	3	90	7	DRY	115	511	0.56	358	9.1	37	10	122	32	-2.5	246	19.0	3.10	12.50	1.47	1.25	3.13	30
28AL	3	90	7	DRY	198	594	0.64	410	8.9	23	3	133	32	53.0	275	9.0	2.50	11.25	1.64	5.00	0.35	10
28AU	3	90	7	DRY	197	593	0.52	333	8.9	24	3	108	16	-2.5	298	9.0	2.20	6.56	1.36	8.21	0.70	22
28BL	3	90	7	DRY	200	596	0.72	461	8.9	26	4	154	56	4.0	298	14.0	2.10	7.81	2.21	3.75	0.35	10
28BU	3	90	7	DRY	199	595	0.48	307	8.7	32	4	84	16	-2.5	256	9.0	1.40	10.31	1.00	11.43	0.70	10
30AL	3	90	7	DRY	190	586	2.00	1280	8.6	40	6	380	326	245.0	270	-4.8	7.40	11.88	2.54	1.00	0.70	12
30AU	3	90	7	DRY	189	585	2.20	1408	8.5	46	7	463	398	327.0	265	-4.8	7.00	16.88	3.23	2.00	0.35	14
30BL	3	90	7	DRY	192	588	1.00	640	8.6	42	7	200	136	87.0	234	9.0	6.40	8.75	1.54	-2.50	0.35	20
30BU	3	90	7	DRY	191	587	1.10	704	8.6	35	5	200	126	122.0	246	5.0	6.80	10.00	1.46	1.00	-0.30	8
31AL	3	90	7	DRY	262	658	2.00	1280	9.1	24	3	440	320	295.0	208	19.0	6.00	30.00	4.00	1.67	0.70	8
31AU	3	90	7	DRY	261	657	1.90	1216	9.2	25	2	420	248	314.0	256	14.0	5.80	31.25	5.00	1.67	1.74	10
31BL	3	90	7	DRY	264	660	1.40	896	9.2	31	3	320	204	126.0	256	7.0	5.60	25.00	3.70	1.67	1.04	8
31BU	3	90	7	DRY	263	659	1.40	896	9.1	24	3	320	200	165.0	256	14.0	5.80	31.88	4.40	1.67	1.39	10
32AL	3	90	7	DRY	258	654	0.88	563	9.5	23	8	240	57	106.0	410	62.0	14.50	5.00	2.70	1.67	0.35	40
32AU	3	90	7	DRY	257	653	0.80	512	9.6	21	15	240	55	60.0	426	7.0	8.80	4.00	2.40	-2.50	0.70	61
32BL	3	90	7	DRY	260	656	0.76	486	9.4	18	6	220	66	63.0	331	8.0	8.00	4.00	1.50	1.67	0.70	63
32BU	3	90	7	DRY	259	655	0.72	461	9.5	18	5	200	65	43.0	308	12.0	4.40	4.63	2.00	1.67	1.04	20
33AL	3	90	7	DRY	254	650	0.18	115	8.8	32	3	8	10	1.0	99	-4.8	0.26	2.88	0.10	1.67	4.87	10
33AU	3	90	7	DRY	253	649	0.18	115	8.8	29	3	6	10	-2.5	95	-4.8	0.31	3.13	-0.08	1.67	5.57	12
33BL	3	90	7	DRY	256	652	0.18	115	8.9	29	3	6	12	-2.5	90	-4.8	0.22	2.50	-0.08	1.67	3.13	10
33BU	3	90	7	DRY	255	651	0.18	115	8.9	29	3	6	12	1.0	95	-4.8	0.24	2.06	0.10	-2.50	4.87	10
34AL	3	90	7	DRY	118	514	0.32	205	8.4	54	4	18	30	22.0	151	-4.8	0.29	5.25	0.33	-2.50	1.04	8
34AU	3	90	7	DRY	117	513	0.32	205	8.4	50	4	10	30	23.0	156	-4.8	0.39	5.50	0.20	-2.50	1.39	14
34BL	3	90	7	DRY	120	516	0.28	179	8.5	52	4	8	14	17.0	137	-4.8	0.22	4.88	0.27	-2.50	0.70	6
34BU	3	90	7	DRY	119	515	0.30	192	8.4	56	4	8	24	21.0	147	-4.8	0.21	5.00	0.33	-2.50	1.39	10

Raw Soil Sample Data

For Quarter 3/90

Site	Qr	Yr	Mn	Sea	Id Num	Lab Num	EC x 1000	Solu Salts ppm	pH	Ca ppm	Mg ppm	Na ppm	Cl ppm	SO4 ppm	HCO3 ppm	CO3 ppm	F ppm	NO3-N ppm	Boron ppm	NH4 ppm	PO4-P ppm	k ppm
35AL	3	90	7	DRY	122	518	0.18	115	8.6	38	3	6	8	-2.5	97	-4.8	0.21	4.50	0.27	-2.50	3.13	10
35AU	3	90	7	DRY	121	517	0.20	128	8.5	43	3	6	10	-2.5	114	-4.8	0.21	5.00	0.40	-2.50	3.13	12
35BL	3	90	7	DRY	124	520	0.20	128	8.5	44	3	6	20	2.0	99	-4.8	0.29	5.00	0.27	-2.50	3.83	12
35BU	3	90	7	DRY	123	519	0.24	154	8.5	42	3	6	22	15.0	104	-4.8	0.17	5.38	0.20	-2.50	4.17	20
36AL	3	90	7	DRY	126	522	0.60	384	8.4	53	4	76	80	20.0	137	-4.8	0.28	23.13	0.67	-2.50	-0.30	8
36AU	3	90	7	DRY	125	521	0.60	384	8.4	72	6	32	126	11.0	102	-4.8	0.20	13.75	0.40	-2.50	1.04	12
36BL	3	90	7	DRY	128	524	0.40	256	8.4	60	5	32	38	35.0	151	-4.8	0.24	8.13	0.40	-2.50	0.70	8
36BU	3	90	7	DRY	127	523	0.32	205	8.5	50	5	18	14	4.0	140	-4.8	0.22	7.50	0.40	-2.50	0.35	16
37AL	3	90	7	DRY	130	526	0.28	179	8.5	58	3	8	14	-2.5	163	-4.8	0.25	4.63	0.33	-2.50	0.35	2
37AU	3	90	7	DRY	129	525	0.28	179	8.4	60	4	6	14	-2.5	151	-4.8	0.20	5.88	0.40	-2.50	1.39	8
37BL	3	90	7	DRY	132	528	0.30	192	8.4	63	4	14	16	3.0	154	-4.8	0.22	9.38	0.47	-2.50	0.35	4
37BU	3	90	7	DRY	131	527	0.26	166	8.5	56	4	6	6	3.0	156	-4.8	0.21	5.25	0.40	-2.50	1.04	8
38AL	3	90	7	DRY	246	642	1.20	768	9.4	13	5	240	72	97.0	284	47.0	0.81	17.50	1.94	5.00	3.83	2
38AU	3	90	7	DRY	245	641	0.64	410	9.2	19	7	128	20	27.0	239	19.0	0.34	9.38	0.69	5.00	3.48	4
38BL	3	90	7	DRY	248	644	0.84	538	9.2	14	4	240	100	75.0	270	28.0	0.76	25.00	1.19	1.25	3.83	4
38BU	3	90	7	DRY	247	643	0.56	358	9.1	29	6	116	20	18.0	220	14.0	0.31	11.25	0.63	2.50	3.13	4
39AL	3	90	7	DRY	250	646	2.00	1280	8.8	28	4	400	468	62.0	151	5.0	0.33	20.63	1.75	-2.50	1.74	6
39AU	3	90	7	DRY	249	645	1.10	704	8.6	30	5	200	228	11.0	166	5.0	0.23	12.50	0.75	1.25	3.13	8
39BL	3	90	7	DRY	252	648	0.96	614	9.0	17	2	200	144	42.0	185	9.0	0.39	15.63	1.50	1.25	2.44	4
39BU	3	90	7	DRY	251	647	0.64	410	8.9	19	3	122	56	27.0	180	12.0	0.32	11.88	0.75	-2.50	2.09	6
40AL	3	90	7	DRY	170	566	0.60	384	8.3	71	8	38	28	118.0	156	-4.8	0.32	9.38	0.64	-2.50	2.44	14
40AU	3	90	7	DRY	169	565	0.52	333	8.4	61	6	30	20	44.0	175	-4.8	0.44	15.00	0.71	-2.50	2.09	22
40BL	3	90	7	DRY	172	568	0.68	435	8.3	85	9	38	46	133.0	142	-4.8	0.22	10.31	0.79	-2.50	1.74	18
40BU	3	90	7	DRY	171	567	0.44	282	8.5	52	6	34	16	-2.5	194	-4.8	0.26	10.00	0.71	-2.50	2.09	18
41AL	3	90	7	DRY	146	542	2.80	1792	8.5	54	6	560	746	101.0	166	-4.8	0.37	32.50	2.53	2.00	0.35	12
41AU	3	90	7	DRY	145	541	1.60	1024	8.2	112	11	260	500	8.0	123	-4.8	0.27	23.75	0.60	2.00	0.35	20
41BL	3	90	7	DRY	148	544	2.00	1280	8.6	39	4	380	452	99.0	123	-4.8	0.50	20.00	2.07	-2.50	-0.30	10
41BU	3	90	7	DRY	147	543	0.84	538	8.3	76	8	97	212	20.0	118	-4.8	0.23	12.50	0.47	2.00	0.35	18
42AL	3	90	7	DRY	242	638	0.28	179	8.6	51	4	22	18	-2.5	144	-4.8	0.28	5.63	0.44	6.67	1.04	4
42AU	3	90	7	DRY	241	637	0.34	218	8.5	55	4	24	18	-2.5	166	-4.8	0.29	6.00	0.44	22.92	1.04	10
42BL	3	90	7	DRY	244	640	0.32	205	8.5	58	4	20	24	-2.5	151	-4.8	0.27	6.56	0.44	1.25	1.39	6
42BU	3	90	7	DRY	243	639	0.32	205	8.5	52	4	22	20	-2.5	159	-4.8	0.31	7.19	0.44	2.50	1.39	8
43AL	3	90	7	DRY	238	634	1.10	704	8.7	41	9	200	118	123.0	232	14.0	1.70	9.38	1.50	2.50	3.48	8
43AU	3	90	7	DRY	237	633	1.30	832	8.5	47	13	220	156	144.0	324	-4.8	2.15	18.13	2.06	3.75	5.22	14
43BL	3	90	7	DRY	240	636	1.20	768	8.6	41	10	220	140	172.0	265	7.0	2.00	10.00	1.81	2.50	3.13	10
43BU	3	90	7	DRY	239	635	1.40	896	8.5	55	16	240	176	203.0	286	-4.8	2.00	19.38	1.94	3.75	5.22	14
44AL	3	90	7	DRY	178	574	1.30	832	8.7	34	7	180	170	28.0	194	2.0	0.22	45.00	2.08	1.00	3.83	122
44AU	3	90	7	DRY	177	573	0.60	384	8.6	43	6	42	54	27.0	178	-4.8	0.18	17.50	0.85	4.00	3.13	70
44BL	3	90	7	DRY	180	576	1.50	960	8.4	52	10	360	248	21.0	170	-4.8	1.60	62.50	2.15	-2.50	2.44	116
44BU	3	90	7	DRY	179	575	0.44	282	8.6	35	6	26	32	-11.0	196	-4.8	0.13	8.75	0.92	1.00	3.13	66
45AL	3	90	7	DRY	202	598	1.10	704	9.3	17	4	280	48	62.0	419	37.0	8.20	18.75	2.79	2.50	-0.30	22
45AU	3	90	7	DRY	201	597	0.92	589	9.2	25	7	260	28	7.0	417	37.0	5.40	15.63	2.93	2.50	0.70	8
45BL	3	90	7	DRY	204	600	0.88	563	9.2	18	4	240	32	6.0	412	37.0	6.00	16.25	2.64	3.75	0.35	6
45BU	3	90	7	DRY	203	599	0.76	486	9.1	27	4	180	16	-2.5	402	33.0	3.00	11.88	1.86	6.07	0.70	14

Raw Soil Data

For Quarter 3/90

Site	Qtr	Yr	Mn	Sea	Id Num	Lab Num	Na exchg Meq/ 100gm	K exchg Meq/ 100gm	Ca exchg Meq/ 100gm	Mg exchg Meq/ 100gm	Total P ppm
01AL	3	90	7	DRY	90	486	2.28	0.49	50.52	2.24	9999.99
01AU	3	90	7	DRY	89	485	1.53	0.77	49.90	2.47	9999.99
01BL	3	90	7	DRY	92	488	1.24	0.77	46.28	2.22	9999.99
01BU	3	90	7	DRY	91	487	0.91	1.34	62.75	3.39	9999.99
02AL	3	90	7	DRY	94	490	4.78	1.37	24.45	3.08	9999.99
02AU	3	90	7	DRY	93	489	0.48	1.46	27.07	2.88	9999.99
02BL	3	90	7	DRY	96	492	1.74	1.40	29.19	3.84	9999.99
02BU	3	90	7	DRY	95	491	0.61	1.40	23.79	3.19	9999.99
03AL	3	90	7	DRY	74	470	18.23	0.98	34.56	2.59	9999.99
03AU	3	90	7	DRY	73	469	9.11	1.12	23.47	2.22	9999.99
03BL	3	90	7	DRY	76	472	15.74	1.07	20.97	2.28	9999.99
03BU	3	90	7	DRY	75	471	4.97	1.19	34.31	2.59	9999.99
04AL	3	90	7	DRY	106	502	0.26	0.74	27.69	1.23	9999.99
04AU	3	90	7	DRY	105	501	0.22	0.90	29.69	1.40	9999.99
04BL	3	90	7	DRY	108	504	0.65	1.02	30.31	1.46	9999.99
04BU	3	90	7	DRY	107	503	0.26	0.97	28.94	1.42	9999.99
05AL	3	90	7	DRY	110	506	1.52	0.67	21.94	1.69	9999.99
05AU	3	90	7	DRY	109	505	0.65	0.92	22.57	1.89	9999.99
05BL	3	90	7	DRY	112	508	1.48	0.90	21.96	1.75	9999.99
05BU	3	90	7	DRY	111	507	0.65	1.02	22.09	1.73	9999.99
06AL	3	90	7	DRY	102	498	5.22	0.46	26.82	1.69	9999.99
06AU	3	90	7	DRY	101	497	1.78	0.79	29.19	1.79	9999.99
06BL	3	90	7	DRY	104	500	0.52	0.41	32.56	1.87	9999.99
06BU	3	90	7	DRY	103	499	0.39	0.59	30.19	1.73	9999.99
07AL	3	90	7	DRY	142	538	2.83	0.59	23.91	3.93	9999.99
07AU	3	90	7	DRY	141	537	1.65	0.67	23.23	3.51	9999.99
07BL	3	90	7	DRY	144	540	1.04	0.61	22.21	3.06	9999.99
07BU	3	90	7	DRY	143	539	1.00	0.90	22.95	3.56	9999.99
08AL	3	90	7	DRY	150	546	3.52	0.64	19.70	1.48	9999.99
08AU	3	90	7	DRY	149	545	0.48	0.61	20.01	1.50	9999.99
08BL	3	90	7	DRY	152	548	2.70	0.59	19.51	1.34	9999.99
08BU	3	90	7	DRY	151	547	1.35	0.84	20.83	1.73	9999.99
09AL	3	90	7	DRY	98	494	0.96	3.07	30.19	3.97	9999.99
09AU	3	90	7	DRY	97	493	0.39	1.48	27.82	2.98	9999.99
09BL	3	90	7	DRY	100	496	0.70	1.58	22.27	2.77	9999.99
09BU	3	90	7	DRY	99	495	0.48	1.40	23.83	2.79	9999.99
10AL	3	90	7	DRY	82	478	0.46	0.63	27.32	2.26	9999.99
10AU	3	90	7	DRY	81	477	0.21	0.63	31.81	1.95	9999.99
10BL	3	90	7	DRY	84	480	0.46	0.65	31.56	1.81	9999.99
10BU	3	90	7	DRY	83	479	0.17	0.70	29.44	1.58	9999.99
11AL	3	90	7	DRY	154	550	5.65	2.56	30.69	2.16	9999.99
11AU	3	90	7	DRY	153	549	4.78	2.30	31.06	2.24	9999.99
11BL	3	90	7	DRY	156	552	5.22	2.56	30.94	2.24	9999.99
11BU	3	90	7	DRY	155	551	5.65	2.56	31.19	2.18	9999.99

Raw Soil Sample Data

For Quarter 3/90

Site	Qtr	Yr	Mn	Sea	Id Num	Lab Num	Na exchg Meq/ 100gm	K exchg Meq/ 100gm	Ca exchg Meq/ 100gm	Mg exchg Meq/ 100gm	Total P ppm
12AL	3	90	7	DRY	182	578	3.39	2.82	24.65	1.83	9999.99
12AU	3	90	7	DRY	181	577	2.70	2.56	24.71	1.77	9999.99
12BL	3	90	7	DRY	184	580	2.83	2.82	25.82	1.89	9999.99
12BU	3	90	7	DRY	183	579	2.36	2.56	25.95	1.79	9999.99
13AL	3	90	7	DRY	186	582	1.69	1.48	28.07	2.38	9999.99
13AU	3	90	7	DRY	185	581	1.82	1.23	27.82	2.26	9999.99
13BL	3	90	7	DRY	188	584	1.65	1.38	24.26	2.08	9999.99
13BU	3	90	7	DRY	187	583	1.99	1.23	28.69	2.32	9999.99
14AL	3	90	7	DRY	86	482	0.87	2.82	34.06	3.10	9999.99
14AU	3	90	7	DRY	85	481	0.50	4.61	36.05	3.97	9999.99
14BL	3	90	7	DRY	88	484	1.28	4.10	35.18	3.56	9999.99
14BU	3	90	7	DRY	87	483	0.99	6.75	27.44	4.60	9999.99
15AL	3	90	7	DRY	158	554	0.26	0.84	24.76	1.42	9999.99
15AU	3	90	7	DRY	157	553	0.26	0.95	24.88	1.34	9999.99
15BL	3	90	7	DRY	160	556	0.26	0.95	24.46	1.46	9999.99
15BU	3	90	7	DRY	159	555	0.26	1.13	23.81	1.32	9999.99
16AL	3	90	7	DRY	78	474	18.64	1.29	29.69	3.00	9999.99
16AU	3	90	7	DRY	77	473	5.39	1.22	31.06	1.83	9999.99
16BL	3	90	7	DRY	80	476	22.37	1.87	31.56	2.96	9999.99
16BU	3	90	7	DRY	79	475	8.29	1.39	28.94	1.69	9999.99
17AL	3	90	7	DRY	206	602	0.30	5.63	32.06	4.71	9999.99
17AU	3	90	7	DRY	205	601	0.30	4.35	32.93	4.27	9999.99
17BL	3	90	7	DRY	208	604	0.26	4.61	30.94	3.00	9999.99
17BU	3	90	7	DRY	207	603	0.26	3.07	32.06	2.73	9999.99
18AL	3	90	7	DRY	214	610	0.30	0.51	24.15	1.62	9999.99
18AU	3	90	7	DRY	213	609	0.26	0.87	24.93	1.40	9999.99
18BL	3	90	7	DRY	216	612	0.30	0.59	24.91	1.52	9999.99
18BU	3	90	7	DRY	215	611	0.26	0.74	24.39	1.50	9999.99
19AL	3	90	7	DRY	210	606	0.35	4.10	30.19	2.30	9999.99
19AU	3	90	7	DRY	209	605	0.35	2.56	27.57	2.01	9999.99
19BL	3	90	7	DRY	212	608	0.48	4.61	31.19	2.34	9999.99
19BU	3	90	7	DRY	211	607	0.35	3.33	28.19	2.06	9999.99
20AL	3	90	7	DRY	218	614	1.44	1.43	19.02	1.93	9999.99
20AU	3	90	7	DRY	217	613	0.78	1.25	18.41	1.66	9999.99
20BL	3	90	7	DRY	220	616	1.22	1.28	18.87	1.91	9999.99
20BU	3	90	7	DRY	219	615	0.70	1.15	18.55	1.62	9999.99
21AL	3	90	7	DRY	222	618	1.39	1.05	19.05	1.81	9999.99
21AU	3	90	7	DRY	221	617	0.48	0.72	21.16	1.95	9999.99
21BL	3	90	7	DRY	224	620	2.38	1.33	17.85	1.60	9999.99
21BU	3	90	7	DRY	223	619	0.57	1.08	20.35	2.03	9999.99
22AL	3	90	7	DRY	226	622	0.22	0.33	21.15	0.82	9999.99
22AU	3	90	7	DRY	225	621	0.22	0.46	20.53	0.80	9999.99
22BL	3	90	7	DRY	228	624	0.17	0.33	20.65	0.76	9999.99
22BU	3	90	7	DRY	227	623	0.17	0.44	20.43	0.78	9999.99

Raw Soil S[illegible]ata

For Quarter 3/90

Site	Qtr	Yr	Mn	Sea	Id Num	Lab Num	Na exchg Meq/ 100gm	K exchg Meq/ 100gm	Ca exchg Meq/ 100gm	Mg exchg Meq/ 100gm	Total P ppm
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23AL	3	90	7	DRY	194	590	3.07	0.95	31.69	2.49	9999.99
23AU	3	90	7	DRY	193	589	6.09	0.97	30.94	2.61	9999.99
23BL	3	90	7	DRY	196	592	3.11	1.10	31.06	2.38	9999.99
23BU	3	90	7	DRY	195	591	7.83	1.00	35.68	3.00	9999.99
24AL	3	90	7	DRY	162	558	1.83	1.83	23.63	2.03	9999.99
24AU	3	90	7	DRY	161	557	1.57	1.94	22.99	1.95	9999.99
24BL	3	90	7	DRY	164	560	2.22	1.41	24.39	2.08	9999.99
24BU	3	90	7	DRY	163	559	1.44	1.99	23.45	2.08	9999.99
25AL	3	90	7	DRY	174	570	2.07	1.48	31.81	4.50	9999.99
25AU	3	90	7	DRY	173	569	1.37	2.02	32.93	4.60	9999.99
25BL	3	90	7	DRY	176	572	0.74	1.66	27.82	4.48	9999.99
25BU	3	90	7	DRY	175	571	1.05	1.56	30.44	3.99	9999.99
26AL	3	90	7	DRY	138	534	0.87	0.46	24.63	1.29	9999.99
26AU	3	90	7	DRY	137	533	0.30	0.54	21.82	1.13	9999.99
26BL	3	90	7	DRY	140	536	0.57	0.49	28.57	1.44	9999.99
26BU	3	90	7	DRY	139	535	0.30	0.56	24.03	1.29	9999.99
27AL	3	90	7	DRY	114	510	6.96	0.77	19.49	1.01	9999.99
27AU	3	90	7	DRY	113	509	2.17	0.97	20.56	1.23	9999.99
27BL	3	90	7	DRY	116	512	4.78	0.92	20.70	1.25	9999.99
27BU	3	90	7	DRY	115	511	1.57	1.18	21.24	1.44	9999.99
28AL	3	90	7	DRY	198	594	2.44	1.05	38.05	2.01	9999.99
28AU	3	90	7	DRY	197	593	2.00	1.31	34.43	1.95	9999.99
28BL	3	90	7	DRY	200	596	3.11	0.84	37.30	1.89	9999.99
28BU	3	90	7	DRY	199	595	1.35	1.08	36.43	1.91	9999.99
30AL	3	90	7	DRY	190	586	4.35	0.97	32.06	3.60	9999.99
30AU	3	90	7	DRY	189	585	6.09	1.23	29.57	3.76	9999.99
30BL	3	90	7	DRY	192	588	3.22	1.00	28.44	3.23	9999.99
30BU	3	90	7	DRY	191	587	2.78	1.02	29.07	3.27	9999.99
31AL	3	90	7	DRY	262	658	3.25	0.51	17.73	0.88	9999.99
31AU	3	90	7	DRY	261	657	3.07	0.59	17.56	0.86	9999.99
31BL	3	90	7	DRY	264	660	2.39	0.54	18.56	0.95	9999.99
31BU	3	90	7	DRY	263	659	2.66	0.61	18.54	1.09	9999.99
32AL	3	90	7	DRY	258	654	2.39	0.33	18.86	0.97	9999.99
32AU	3	90	7	DRY	257	653	1.96	0.33	17.56	0.86	9999.99
32BL	3	90	7	DRY	260	656	1.87	0.33	19.10	0.99	9999.99
32BU	3	90	7	DRY	259	655	1.83	0.36	18.69	1.11	9999.99
33AL	3	90	7	DRY	254	650	0.13	0.26	4.53	0.35	9999.99
33AU	3	90	7	DRY	253	649	0.13	0.26	4.55	0.35	9999.99
33BL	3	90	7	DRY	256	652	0.17	0.28	5.43	0.37	9999.99
33BU	3	90	7	DRY	255	651	0.17	0.26	5.10	0.37	9999.99
34AL	3	90	7	DRY	118	514	0.26	0.56	23.08	1.11	9999.99
34AU	3	90	7	DRY	117	513	0.17	0.67	22.38	1.07	9999.99
34BL	3	90	7	DRY	120	516	0.17	0.51	22.94	1.07	9999.99
34BU	3	90	7	DRY	119	515	0.17	0.64	23.42	1.13	9999.99

Raw Soil Sample Data

For Quarter 3/90

Site	Qtr	Yr	Mn	Sea	Id Num	Lab Num	Na exchg Meq/ 100gm	K exchg Meq/ 100gm	Ca exchg Meq/ 100gm	Mg exchg Meq/ 100gm	Total P ppm
35AL	3	90	7	DRY	122	518	0.13	0.31	12.96	0.58	9999.99
35AU	3	90	7	DRY	121	517	0.17	0.41	14.45	0.68	9999.99
35BL	3	90	7	DRY	124	520	0.17	0.41	13.44	0.64	9999.99
35BU	3	90	7	DRY	123	519	0.17	0.49	12.84	0.62	9999.99
36AL	3	90	7	DRY	126	522	0.87	0.84	31.19	2.10	9999.99
36AU	3	90	7	DRY	125	521	0.35	1.20	30.94	2.51	9999.99
36BL	3	90	7	DRY	128	524	0.44	0.82	30.06	1.89	9999.99
36BU	3	90	7	DRY	127	523	0.26	0.82	28.69	2.01	9999.99
37AL	3	90	7	DRY	130	526	0.22	0.38	25.00	1.01	9999.99
37AU	3	90	7	DRY	129	525	0.17	0.54	22.70	0.97	9999.99
37BL	3	90	7	DRY	132	528	0.22	0.33	24.84	1.03	9999.99
37BU	3	90	7	DRY	131	527	0.17	0.59	24.78	1.11	9999.99
38AL	3	90	7	DRY	246	642	9.94	0.59	37.05	3.21	9999.99
38AU	3	90	7	DRY	245	641	3.31	0.59	39.55	3.41	9999.99
38BL	3	90	7	DRY	248	644	6.96	0.56	38.05	3.45	9999.99
38BU	3	90	7	DRY	247	643	2.22	0.61	45.28	3.31	9999.99
39AL	3	90	7	DRY	250	646	4.78	0.59	29.82	3.00	9999.99
39AU	3	90	7	DRY	249	645	2.44	0.77	32.19	2.38	9999.99
39BL	3	90	7	DRY	252	648	2.78	0.56	31.06	3.25	9999.99
39BU	3	90	7	DRY	251	647	1.62	0.61	30.81	2.51	9999.99
40AL	3	90	7	DRY	170	566	0.65	1.13	28.07	1.93	9999.99
40AU	3	90	7	DRY	169	565	0.61	1.70	30.44	1.95	9999.99
40BL	3	90	7	DRY	172	568	0.70	1.38	28.07	1.93	9999.99
40BU	3	90	7	DRY	171	567	0.61	1.38	29.07	1.87	9999.99
41AL	3	90	7	DRY	146	542	4.35	0.51	22.14	1.44	9999.99
41AU	3	90	7	DRY	145	541	1.70	0.72	22.95	1.64	9999.99
41BL	3	90	7	DRY	148	544	2.91	0.59	22.13	1.52	9999.99
41BU	3	90	7	DRY	147	543	0.83	0.77	22.64	1.71	9999.99
42AL	3	90	7	DRY	242	638	0.30	0.41	25.00	1.11	9999.99
42AU	3	90	7	DRY	241	637	0.30	0.59	25.11	1.23	9999.99
42BL	3	90	7	DRY	244	640	0.26	0.46	25.90	1.07	9999.99
42BU	3	90	7	DRY	243	639	0.26	0.59	23.69	1.15	9999.99
43AL	3	90	7	DRY	238	634	1.78	0.74	22.60	3.43	9999.99
43AU	3	90	7	DRY	237	633	1.96	0.92	22.80	4.50	9999.99
43BL	3	90	7	DRY	240	636	1.78	0.69	21.79	3.35	9999.99
43BU	3	90	7	DRY	239	635	1.96	0.84	22.39	4.23	9999.99
44AL	3	90	7	DRY	178	574	1.99	6.91	27.94	3.27	9999.99
44AU	3	90	7	DRY	177	573	0.61	3.84	28.57	2.84	9999.99
44BL	3	90	7	DRY	180	576	1.82	6.40	26.95	3.23	9999.99
44BU	3	90	7	DRY	179	575	0.52	4.61	28.19	2.88	9999.99
45AL	3	90	7	DRY	202	598	6.09	0.64	32.31	2.28	9999.99
45AU	3	90	7	DRY	201	597	5.65	0.79	32.56	2.69	9999.99
45BL	3	90	7	DRY	204	600	6.09	0.74	32.19	2.67	9999.99
45BU	3	90	7	DRY	203	599	3.25	0.87	32.06	3.02	9999.99

Raw Soil Data

For Quarter 4/90

Site	Qr	Yr	Mn	Sea	Id Num	Lab Num	EC x 1000	Solu Salts ppm	pH	Ca ppm	Mg ppm	Na ppm	Cl ppm	SO4 ppm	HCO3 ppm	CO3 ppm	F ppm	NO3-N ppm	Boron ppm	NH4 ppm	PO4-P ppm	k ppm
07AL	4	90	11	POST	286	986	0.72	461	9.0	27	4	140	54	34.0	261	2.0	2.70	21.88	2.04	5.00	3.20	6
07AU	4	90	11	POST	285	985	0.56	358	8.8	36	5	86	16	-2.5	221	-4.8	1.60	28.75	1.67	1.67	5.82	22
07BL	4	90	11	POST	288	988	0.86	550	8.9	30	4	150	68	3.0	225	-4.8	2.00	45.00	2.08	5.00	2.91	10
07BU	4	90	11	POST	287	987	0.84	538	8.7	38	6	126	48	33.0	208	-4.8	1.75	50.00	2.42	5.83	4.07	20
11AL	4	90	11	POST	278	978	1.90	1216	8.8	50	6	400	268	234.0	296	2.0	11.00	23.13	3.25	1.67	1.16	24
11AU	4	90	11	POST	277	977	2.20	1408	8.6	50	4	460	370	269.0	225	-4.8	8.20	36.25	3.75	3.33	1.16	30
11BL	4	90	11	POST	280	980	1.70	1088	8.8	47	4	300	248	209.0	261	-4.8	11.00	32.50	3.17	-2.50	1.16	26
11BU	4	90	11	POST	279	979	1.50	960	8.7	47	4	340	300	251.0	256	-4.8	12.00	33.75	3.58	-2.50	0.87	30
12AL	4	90	11	POST	294	994	3.80	2432	8.2	195	18	580	816	236.0	130	-4.8	4.00	105.00	1.75	7.50	3.20	86
12AU	4	90	11	POST	293	993	2.80	1792	8.3	150	13	400	608	156.0	128	-4.8	3.20	100.00	2.92	6.67	3.49	80
12BL	4	90	11	POST	296	996	3.80	2432	8.3	185	17	660	936	236.0	130	-4.8	3.40	125.00	2.42	8.33	2.62	88
12BU	4	90	11	POST	295	995	3.00	1920	8.4	113	10	500	668	196.0	132	-4.8	3.10	100.00	3.25	6.67	3.49	80
13AL	4	90	11	POST	290	990	1.10	704	8.7	37	6	220	152	97.0	285	-4.8	6.80	5.63	2.04	5.00	1.46	22
13AU	4	90	11	POST	289	989	1.00	640	8.7	48	6	180	104	96.0	327	-4.8	4.40	7.50	0.83	3.33	1.75	18
13BL	4	90	11	POST	292	992	1.10	704	8.7	35	5	220	184	81.0	221	-4.8	9.20	6.88	1.83	5.00	1.46	20
13BU	4	90	11	POST	291	991	0.92	589	8.8	35	4	180	118	68.0	252	-4.8	5.80	16.25	1.67	5.00	1.75	14
23AL	4	90	11	POST	298	998	1.10	704	8.6	46	5	180	102	167.0	373	4.0	5.40	6.56	2.00	3.75	2.33	12
23AU	4	90	11	POST	297	997	2.20	1408	8.1	151	22	380	256	518.0	548	-4.8	3.60	10.31	1.82	5.00	3.78	28
23BL	4	90	11	POST	300	1000	0.96	614	8.6	33	3	160	107	115.0	287	-4.8	8.00	5.38	1.45	2.50	1.75	6
23BU	4	90	11	POST	299	999	1.00	640	8.6	33	4	160	104	133.0	291	4.0	4.40	6.56	1.55	2.50	2.04	8
24AL	4	90	11	POST	282	982	1.20	768	8.9	35	4	200	126	98.0	212	-4.8	4.20	40.00	1.50	-2.50	1.46	12
24AU	4	90	11	POST	281	981	0.92	589	8.8	41	5	152	74	65.0	201	-4.8	2.60	46.25	1.92	-2.50	2.33	32
24BL	4	90	11	POST	284	984	1.10	704	8.8	35	4	180	104	83.0	216	-4.8	3.80	33.75	1.83	-2.50	1.75	14
24BU	4	90	11	POST	283	983	0.68	435	8.8	38	6	108	80	30.0	225	-4.8	2.20	20.63	1.67	-2.50	2.33	30
25AL	4	90	11	POST	318	1018	2.00	1280	8.3	108	21	152	202	326.0	124	-4.8	1.85	50.00	0.85	3.33	1.46	26
25AU	4	90	11	POST	317	1017	1.80	1152	8.3	91	16	160	96	455.0	132	-4.8	1.70	45.00	0.92	1.67	1.75	30
25BL	4	90	11	POST	320	1020	1.70	1088	8.3	133	25	144	178	96.0	119	-4.8	1.80	62.50	1.08	3.33	1.46	22
25BU	4	90	11	POST	319	1019	2.00	1280	8.3	143	26	146	156	266.0	115	-4.8	1.50	36.25	1.15	1.67	2.62	32
28AL	4	90	11	POST	302	1002	0.84	538	8.9	26	2	160	82	122.0	168	4.0	1.05	17.81	1.36	2.50	1.46	6
28AU	4	90	11	POST	301	1001	0.48	307	9.2	21	2	101	10	-2.5	313	18.0	1.80	8.13	2.45	2.50	1.46	12
28BL	4	90	11	POST	304	1004	0.68	435	8.9	19	2	146	72	82.0	172	4.0	1.00	23.75	1.45	1.25	1.16	6
28BU	4	90	11	POST	303	1003	0.52	333	9.2	26	3	103	8	-2.5	238	13.0	1.45	10.63	1.73	2.50	1.46	16
30AL	4	90	11	POST	310	1010	1.30	832	8.7	25	3	240	180	367.0	241	4.0	5.80	18.75	1.73	5.00	0.87	6
30AU	4	90	11	POST	309	1009	1.20	768	8.6	35	5	220	148	157.0	234	4.0	5.00	24.38	1.91	5.00	0.87	8
30BL	4	90	11	POST	312	1012	1.60	1024	8.6	45	6	220	250	388.0	223	4.0	5.20	15.63	1.91	6.88	0.87	10
30BU	4	90	11	POST	311	1011	1.30	832	8.6	38	5	240	180	198.0	256	4.0	5.20	15.00	1.91	6.88	1.16	10
31AL	4	90	11	POST	334	1034	1.20	768	9.6	31	5	248	96	88.0	328	8.0	16.00	11.25	2.77	1.67	1.75	6
31AU	4	90	11	POST	333	1033	1.10	704	9.6	26	9	210	72	-2.5	322	17.0	3.80	32.50	2.54	1.67	3.20	20
31BL	4	90	11	POST	336	1036	1.40	896	9.6	26	5	267	150	161.0	331	22.0	11.50	13.75	4.38	1.67	2.04	16
31BU	4	90	11	POST	335	1035	1.10	704	9.6	34	10	152	69	4.0	353	10.0	7.20	27.50	2.85	3.33	2.62	16
32AL	4	90	11	POST	314	1014	1.00	640	9.5	18	2	200	60	177.0	300	9.0	11.00	10.63	1.73	-2.50	0.87	2
32AU	4	90	11	POST	313	1013	0.88	563	9.6	17	2	180	60	75.0	274	13.0	6.60	11.88	2.27	1.25	1.46	4
32BL	4	90	11	POST	316	1016	0.88	563	9.5	19	4	180	64	90.0	247	13.0	10.00	7.50	1.55	1.25	1.16	6
32BU	4	90	11	POST	315	1015	0.76	486	9.6	15	3	160	48	12.0	247	13.0	6.80	8.44	2.27	1.25	1.16	4

Raw Soil Sample Data

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Site	Qr	Yr	Mn	Sea	Id Num	Lab Num	EC x 1000	Solu Salts ppm	pH	Ca ppm	Mg ppm	Na ppm	Cl ppm	SO4 ppm	HCO3 ppm	CO3 ppm	F ppm	NO3-N ppm	Boron ppm	NH4 ppm	PO4-P ppm	k ppm
43AL	4	90	11	POST	346	1046	2.60	1664	8.6	63	17	500	488	503.0	236	4.0	1.90	10.00	3.09	5.83	4.07	14
43AU	4	90	11	POST	345	1045	1.90	1216	8.3	81	22	300	324	235.0	311	-4.8	2.40	38.75	3.27	10.83	6.40	16
43BL	4	90	11	POST	348	1048	2.20	1408	8.7	58	13	380	404	383.0	223	4.0	2.20	6.88	3.00	5.00	2.62	10
43BU	4	90	11	POST	347	1047	1.50	960	8.3	57	14	220	224	195.0	300	-4.8	2.00	35.00	2.73	9.17	6.40	12
45AL	4	90	11	POST	306	1006	1.10	704	9.7	17	2	180	50	58.0	360	51.0	9.60	13.12	3.82	-2.50	1.16	6
45AU	4	90	11	POST	305	1005	0.68	435	9.4	18	3	160	22	-2.5	300	13.0	2.20	16.88	1.55	2.50	1.75	8
45BL	4	90	11	POST	308	1008	0.96	614	9.6	17	3	200	61	4.0	283	43.0	7.60	19.38	2.91	1.25	0.87	4
45BU	4	90	11	POST	307	1007	0.64	410	9.5	17	9	160	8	-2.5	381	30.0	2.80	15.00	1.73	1.25	1.16	8

Raw Soil Data

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Site	Qtr	Yr	Mn	Sea	Id Num	Lab Num	Na exchg Meq/ 100gm	K exchg Meq/ 100gm	Ca exchg Meq/ 100gm	Mg exchg Meq/ 100gm	Total P ppm
07AL	4	90	11	POST	286	986	1.78	0.56	20.43	3.16	9999.99
07AU	4	90	11	POST	285	985	0.91	0.95	20.07	2.49	9999.99
07BL	4	90	11	POST	288	988	1.48	0.61	19.92	2.51	9999.99
07BU	4	90	11	POST	287	987	1.13	0.76	18.59	2.40	9999.99
11AL	4	90	11	POST	278	978	4.78	2.05	20.80	1.81	9999.99
11AU	4	90	11	POST	277	977	4.78	2.30	21.20	1.95	9999.99
11BL	4	90	11	POST	280	980	3.91	2.05	21.06	1.73	9999.99
11BU	4	90	11	POST	279	979	4.35	2.30	21.02	1.77	9999.99
12AL	4	90	11	POST	294	994	3.48	2.05	18.76	1.36	9999.99
12AU	4	90	11	POST	293	993	2.48	2.00	17.55	1.15	9999.99
12BL	4	90	11	POST	296	996	4.35	2.30	21.33	1.56	9999.99
12BU	4	90	11	POST	295	995	3.18	2.05	17.70	1.07	9999.99
13AL	4	90	11	POST	290	990	2.22	1.56	18.35	1.79	9999.99
13AU	4	90	11	POST	289	989	1.70	1.23	19.46	1.69	9999.99
13BL	4	90	11	POST	292	992	2.09	1.43	18.26	1.66	9999.99
13BU	4	90	11	POST	291	991	1.87	1.08	18.66	1.48	9999.99
23AL	4	90	11	POST	298	998	3.04	1.28	21.31	1.85	9999.99
23AU	4	90	11	POST	297	997	3.18	1.33	16.35	1.66	9999.99
23BL	4	90	11	POST	300	1000	2.87	1.02	22.92	1.83	9999.99
23BU	4	90	11	POST	299	999	2.87	1.00	20.66	2.08	9999.99
24AL	4	90	11	POST	282	982	2.87	1.36	23.27	1.83	9999.99
24AU	4	90	11	POST	281	981	1.61	1.97	19.16	1.60	9999.99
24BL	4	90	11	POST	284	984	2.22	1.36	20.26	1.75	9999.99
24BU	4	90	11	POST	283	983	1.44	2.30	20.27	1.77	9999.99
25AL	4	90	11	POST	318	1018	1.83	1.59	22.97	3.58	9999.99
25AU	4	90	11	POST	317	1017	1.56	1.46	20.65	2.96	9999.99
25BL	4	90	11	POST	320	1020	1.56	1.36	22.59	3.25	9999.99
25BU	4	90	11	POST	319	1019	1.37	1.43	19.36	2.75	9999.99
28AL	4	90	11	POST	302	1002	2.83	1.08	22.08	1.56	9999.99
28AU	4	90	11	POST	301	1001	1.78	1.20	25.20	1.54	9999.99
28BL	4	90	11	POST	304	1004	2.65	1.08	21.83	1.62	9999.99
28BU	4	90	11	POST	303	1003	1.91	1.28	22.45	1.58	9999.99
30AL	4	90	11	POST	310	1010	3.44	1.00	16.90	1.79	9999.99
30AU	4	90	11	POST	309	1009	3.09	1.02	18.82	1.97	9999.99
30BL	4	90	11	POST	312	1012	3.91	1.08	19.59	2.14	9999.99
30BU	4	90	11	POST	311	1011	3.13	1.02	16.17	1.71	9999.99
31AL	4	90	11	POST	334	1034	2.74	0.44	12.84	0.58	9999.99
31AU	4	90	11	POST	333	1033	2.13	0.90	17.51	0.78	9999.99
31BL	4	90	11	POST	336	1036	3.26	0.59	15.32	0.76	9999.99
31BU	4	90	11	POST	335	1035	2.52	0.90	11.31	0.68	9999.99
32AL	4	90	11	POST	314	1014	2.44	0.20	13.81	0.72	9999.99
32AU	4	90	11	POST	313	1013	2.03	0.23	13.02	0.64	9999.99
32BL	4	90	11	POST	316	1016	2.40	0.20	13.69	0.72	9999.99
32BU	4	90	11	POST	315	1015	1.78	0.20	16.39	0.76	9999.99

Raw Soil Sample Data

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Site	Qtr	Yr	Mn	Sea	Id Num	Lab Num	Na exchg Meq/ 100gm	K exchg Meq/ 100gm	Ca exchg Meq/ 100gm	Mg exchg Meq/ 100gm	Total P ppm
43AL	4	90	11	POST	346	1046	3.48	0.77	15.87	3.39	9999.99
43AU	4	90	11	POST	345	1045	2.43	0.82	14.10	3.19	9999.99
43BL	4	90	11	POST	348	1048	4.35	0.67	13.31	2.73	9999.99
43BU	4	90	11	POST	347	1047	2.24	0.74	13.34	2.98	9999.99
45AL	4	90	11	POST	306	1006	4.35	0.59	14.75	1.21	9999.99
45AU	4	90	11	POST	305	1005	3.00	0.72	16.14	1.48	9999.99
45BL	4	90	11	POST	308	1008	3.91	0.56	16.50	1.23	9999.99
45BU	4	90	11	POST	307	1007	3.04	0.74	21.39	1.77	9999.99

H-1. Color infrared imagery for monitoring site 11

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H-2. Color infrared imagery for monitoring site 13