NUS-5096

Annual Report for PVNGS Salt Deposition Monitoring Program

January - December 1987

Prepared for

Arizona Nuclear Power Project
Phoenix, Arizona

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Abstract

The PVNGS salt deposition and impact monitoring program began operation in May 1983 and is intended to meet the commitment for a monitoring program as called for in the PVNGS Environmental Report, Construction Permit Stage and required by the operating license. This annual report describes the results of the sampling activities conducted during January through December 1987 and presents an analysis of these data. The media sampled include air, cooling tower basin water, deposited soluble and insoluble minerals (salt), soils, and vegetation (indigenous and cultivated).

Results for the various media sampled in the 1987 PVNGS drift monitoring program have been compared with 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 2 miles of the PVNGS. Since the 1986 results, as presented in last year's annual report, did not produce such findings in any offsite area, 1987 PVNGS operations appear to have slightly extended the range of influence of PVNGS cooling tower drift emission.

As in 1986, there were no cultivated sites at which significant changes occurred in the same parameter (analyte) for all media sampled. The 1987 cooling tower operations at PVNGS had no significant effects on the offsite environment.

As a result of these findings, no changes to the current monitoring program are recommended for 1988.

1 Introduction

NUS Corporation is conducting a salt deposition and impact monitoring program in the vicinity of the Palo Verde Nuclear Generating Station (PVNGS) for the Arizona Nuclear Power Project (ANPP). The objective of this monitoring program is to determine the environmental impact of salt drift emissions from the operation of the PVNGS round mechanical draft cooling towers.

This annual report presents the results of laboratory analyses of samples collected from January through December 1987 and an assessment of their significance. The media sampled include agricultural crops, indigenous vegetation, soil, dustfall, particulates collected by low-volume air filters, and cooling tower basin water. Also presented is a comparison of data collected during plant operation with those collected during a preoperational period (1983 through 1985), as required by the PVNGS Units 1, 2, and 3 Environmental Protection Plans, Sections 4.2.2 and 5.4.1 (Appendix B of Facility Operating Licenses NPF-41, NPF-51, and NPF-74). The preoperational data, which exclude data for sites 16, 20, 80, 81, and 83 for 1985, are derived from a previous study (NUS, 1987a).

Specific assessments in this report include (1) the levels of airborne soluble and insoluble deposits, (2) the chemistry of surficial soils, (3) the salt concentrations in leaf tissue of agricultural crops and indigenous plants, and (4) the yield of cotton crops. Interrelationships observed between the measurements are also presented.

Additionally, this report provides a description, in the form of a climatological summary, of the area meteorology as measured at the PVNGS meteorological tower during the report period, and a modeling assessment of drift deposition during the period using actual cooling tower operating data and site meteorological data. Included as appendixes are tabulations of the plant operating data upon which the assessments are based. Meteorological data summaries for 1987 are presented in another report (NUS, 1988a).

2 Monitoring Program Summary

The salt deposition and impact monitoring program began in May 1983. It is intended to meet the commitment to a monitoring program called for in the Environmental Report, Construction Permit Stage (ER-CP) (PVNGS, 1974, Section 6.2.5), and to satisfy the requirements of the PVNGS Units 1, 2, and 3 Environmental Protection Plans, Sections 4.2.2 and 5.4.1 (Appendix B of Facility Operating Licenses NPF-41, NPF-51, and NPF-74).

As described in Salt Deposition and Impact Monitoring Plan, Revision 5 (NUS, 1987b), the monitoring program was designed to (1) determine levels of airborne salt deposition; (2) define physical and chemical properties of surficial soils; (3) estimate species richness and cover and measure the salt loading of agricultural crops and indigenous plant communities in the vicinity of PVNGS; and (4) estimate cotton crop yield. Several background locations that would not be affected by the operation of the PVNGS cooling towers were established as control sites. These sites were selected to give an indication of any long-term natural changes.

The following sections provide a brief summary of the sampling activities conducted during January through December 1987 that together constitute the PVNGS salt deposition and impact monitoring program. The media sampled included air, cooling tower basin water, deposited soluble and insoluble minerals (salt), soils, and vegetation (indigenous and cultivated). A description of salt emission and deposition modeling of the PVNGS area, which involved the use of actual plant operating and meteorological data for this period, is also presented in Section 2.2 of this report.

2.1 ONSITE METEOROLOGICAL MEASUREMENTS PROGRAM

The onsite meteorological measurements program at the site, which began on August 13, 1973, is described in the Environmental Report, Operating License Stage (ER-OL) (PVNGS, 1979). The measurement instruments are deployed at two heights (35 and 200 feet) on a guyed tower in the northwestern portion of the site.

Digital meteorological data have been recorded by the upgraded PVNGS meteorological system since October 1985. Before October 1985, such data were manually reduced from analog strip charts.

Monthly and annual statistics on all meteorological parameters collected at PVNGS were processed and compared with historical data. The results of these programs for calendar year 1987 are discussed in more detail in Section 3.

2.2 COOLING TOWER EMISSIONS AND MODELING

2.2.1 Cooling Tower Basin Water

Cooling tower basin water was sampled during all months of cooling tower operation in 1987. The chemical composition of the cooling tower basin water and drift was compared with that of deposits (dustfall jars) and suspended airborne materials (particulates collected on low-volume filters) to identify any changes in salt composition associated with cooling tower operation. A summary of cooling tower operation for the period January through December 1987 is presented in Section 4.

The cooling tower basin water samples were analyzed for the major constituents identified in Table 3.6-1 of the ER-OL to determine the composition of the drift. These constituents include calcium, magnesium, potassium, chloride, sodium, nitrate, sulfate, and silica. Minor constituents were also quantitatively assessed to the extent feasible.

2.2.2 Emissions Modeling

The NUS FOG code was used to calculate the deposition of dissolved solids (salt) emitted as drift by the round mechanical draft cooling towers of PVNGS Units 1, 2, and 3. Input to the code consisted of sequential hourly meteorological data for 1987, which were obtained from the PVNGS meteorological tower system. Included were daily plant operating data--i.e., the number of fans in operation; the circulating water flow rate; the heat release rate; the total dissolved solids concentration; and the drift rate and droplet size distribution as determined from emission tests of the towers (ESC, 1983).

Table 2-1. Distance and direction of the 48 drift deposition monitoring sites from centroid of PVNGS Unit 2 cooling towers (sheet 2 of 2)

Site	Distance (miles)	Direction (sector)	Site type	Onsite vs. offsite	Sample[a]
32	3.9	SE	Agricultural	Offsite	DF, S, AG
33	5.3	SE	Native	Offsite	DF, S
34	6.7	NE	Native	Offsite	DF, S
35	9.9	NE	Native	Offsite	DF, S
36	12.8	NE	Native	Offsite	DF, S
37	15.0	NE	Native	Offsite	DF, S
38	10.0	SW	Native	Offsite	DF, S
39	11.5	SW	Native	Offsite	DF, S
40	18.2	WNW	Native control	Offsite	DF, S, NV
41	2.8	NE	Native	Offsite	DF, S
42	16.6	SSE	Native control	Offsite	DF, S, NV
43	15.0	SSE	Agricultural control	Offsite	DF, S, AG
44	6.6	NW	Native	Offsite	DF, S, NV
45	5.1	SW	Agricultural	Offsite	DF, S, AG
80	0.5	NE	Supplemental	Onsite	DF
81	0.2	NNW	Supplemental	Onsite	DF
82	0.5	SSW	Supplemental	Onsite	DF
83	0.3	ESE	Supplemental	Onsite	DF

[a]DF, dustfall; S, soils; NV, native vegetation; AG, agricultural crops; LVA, air by low-volume air sampler.

Table 2-1. Distance and direction of the 48 drift deposition monitoring sites from centroid of PVNGS Unit 2 cooling towers (sheet 1 of 2)

Site	Distance (miles)	Direction (sector)	Site type	Onsite vs. offsite	Sample[a]
1	1.3	NE	Native	Onsite	DF, S, NV
2	1.5	NE	Native	Onsite	DF, S, NV
3	0.6	NNW	Native	Onsite	DF, S, NV
4	2.2	SSE	Native	Onsite	DF, S, NV
5	2.0	S	Native	Onsite	DF, S
6	1.8	S	Native	Onsite	DF, S, NV
7	5.1	ENE	Agricultural	Offsite	DF, S, AG
8	2.1	N	Native	Offsite	DF, S, LVA
9	1.8	NNE	Native	Offsite	DF, S, LVA
10	1.6	NE	Native	Onsite	DF, S, LVA
11	2.0	NW	Agricultural	Offsite	DF, S, AG
12	4.8	NW	Agricultural	Offsite	DF, S, AG
13	3.2	NNW	Agricultural	Offsite	DF, S, AG
14	1.0	NE	Native	Onsite	DF, S
15	5.0	N	Native	Offsite	DF, S
16	0.6	NNE	Native	Onsite	DF, S
17	4.0	W	Native	Offsite	DF, S
18	2.8	W	Native	Offsite	DF, S
19	2.3	W	Native	Offsite	DF, S
20	0.4	WSW	Native	Onsite	DF, S, LVA
21	3.1	E	Native	Offsite	DF, S, LVA
22	4.8	E	Native	Offsite	DF, S
23	2.3	SW	Agricultural	Offsite	DF, S, AG
24	4.0	N	Agricultural	Offsite	DF, S, AG
25	19.0	WNW	Agricultural control	Offsite	DF, S, AG
26	5.0	NE	Native	Offsite	DF, S
27	2.3	S	Native	Onsite	DF, S, LVA
28	3.7	SW	Agricultural	Offsite	DF, S, AG
30	3.9	SSW	Agricultural	Offsite	DF, S, AG
31	3.5	SSE	Agricultural	Offsite	DF, S, AG

total sodium, phosphate, calcium, potassium, magnesium, soluble sulfate, nitrate, chloride, and fluoride.

2.5.3 Aerial Photography/Remote Sensing

Indigenous vegetation and agricultural crops were monitored by aerial (color infrared) photography. The principal crops grown in a 5-mile radius of PVNGS were photographed near the time of peak productivity (September).

2.6 AIRBORNE SALT MEASUREMENTS

Airborne salt concentrations were measured by collecting particles on a low-volume particulate sampler. Measurements were taken from the existing low-volume samplers at six locations (Figure 2-1) being used as part of the PVNGS radiological monitoring program. The filters were collected weekly for radiological analysis and composited monthly for chemical analysis. The composite filters were analyzed for calcium, chloride, iron, fluoride, potassium, magnesium, sodium, nitrate (as nitrogen), sulfate, and phosphate (as phosphorus).

exchangeable potassium, exchangeable magnesium, pH, and electrical conductivity.

2.5 VEGETATION MEASUREMENTS

2.5.1 Agricultural Crops

At 8 of the 13 agricultural monitoring sites (Figure 2-2), agricultural crops were sampled twice each growing season (July and September) before defoliation (or harvest) for the estimation of leaf tissue salt loading. (Five of the sites--7, 12, 24, 28, and 45--were fallow during the 1987 growing season.) Sites 11 and 13 were also sampled in August. Cotton yield was estimated by collecting the seed and fiber (boll) from randomly selected cotton plots.

Agricultural crop samples were sent to a laboratory for analysis. The samples were oven-dried at 70°C for 24 hours, dry-weighed, ground in a blender, and stored in Kraft paper bags. The dried samples were analyzed for total sodium, calcium, potassium, magnesium, phosphate, soluble sulfate, nitrate, chloride, and fluoride.

2.5.2 Indigenous Vegetation

Representative native plant communities, which have been identified and monitored since 1976 to determine baseline conditions, were sampled semi-annually (March and October). The locations of the eight indigenous vegetation sites are depicted in Figure 2-2.

Two indigenous plant communities, one dominated by creosote-bush and the other by salt-bush, occur on and in the vicinity of PVNGS. Associated with these are mesquite and several species of cacti. The indigenous vegetative sampling conducted within each of the existing sites included measurement of species richness and relative cover and measurement of the salt concentration in leaf tissues of the dominant flora (other than cacti).

After collection, native vegetation samples were sent to a laboratory for analysis. These samples were oven-dried at 70°C for 24 hours, dry-weighed, ground, and stored in Kraft paper bags. The dried samples were analyzed for

Figure 2-1 shows the locations of the 44 sites where drift deposition samples were collected. In addition to the 44 sites committed in the Monitoring Plan, ANPP established 4 interim dustfall-only onsite sampling locations in May 1985. These locations, sites 80-83 (not shown in Figure 2-1), were established close to the cooling towers to provide unambiguous indications of drift deposition above the background level. The data will be collected over a limited period for confirmation of the drift deposition model. Table 2-1 lists the approximate distances (miles) and directions (sectors) from the centroid of the PVNGS Unit 2 cooling tower array of all 48 monitoring sites.

The laboratory analyzed the collected drift deposition samples for total suspended solids and for the most significant dissolved components of the cooling tower drift as identified in Table 3.6-1 of the ER-OL (PVNGS, 1979). Since copper sulfate was used as an algicide from January through May 1987, the analyses also included copper.

2.4 SOILS MEASUREMENTS

At each of the 44 monitoring locations depicted in Figure 2-1, soil samples were collected in April (following the 1987 wet season) and in July (following the dry season). Collections were also made at all 13 agricultural sites after cotton defoliation (November). The samples were drawn from the upper and lower fractions of five cores on each of two transects. Sampling was in accordance with the methods described by the U.S. Department of Energy's Environmental Measurements Laboratory Procedures Manual (DOE, no date). A soil auger was used to collect 8-centimeter-diameter core samples in depth increments of 30 centimeters, which were divided into upper (0- to 15-centimeter) and lower (15- to 30-centimeter) segments. The upper and lower segments for each transect were separately combined to form four composites, one for each depth increment for each of the two transects. From each composite two samples were taken and labeled. The labeled samples were then taken to the analytical laboratory, where one of each composite was analyzed and the other retained in storage.

Soil samples were each analyzed for soluble sodium, calcium, potassium, magnesium, sulfate, nitrate, chloride, fluoride, carbonate, bicarbonate, ammonium, phosphate, boron, exchangeable sodium, exchangeable calcium,

2.3 SALT DEPOSITION MEASUREMENTS

The measurement of salt deposition was accomplished through the collection of dustfall samples, which were then analyzed for dissolved mineral content and suspended solids. Sampling was accomplished by placing, at selected monitoring locations, pairs of open jars containing demineralized water. The jars were 6 inches in diameter and 18 inches deep. The 18-inch-deep jar recommended by the American Society for Testing and Materials (ASTM) was used for dustfall collection. This jar is regarded as the most suitable vessel for sampling in a desert environment; it requires less frequent checking of the water level than other, shallower jars. Two jars were placed at each sampling location to provide for an estimate of sampling precision.

The jars were elevated approximately 3 feet above the ground surface on stands, and a bird ring was placed around the edge of each jar to prevent birds from perching and contaminating the sample. This height was used instead of the minimum height of 8 feet recommended by the ASTM (1970) so as to permit the collection of drift deposition that occurs at typical plant grown height. A chemically inert 1- to 2-millimeter conical screen was suspended above the maximum water level in the jars to keep out potential contaminants such as those attributable to insects and birds.

The monthly sampling procedure followed the ASTM method for the collection of dustfall. At the end of each month the jars were collected and a clean set of jars installed. The collected sample from each jar is first transferred to a graduated cylinder. The jar is rinsed to extract any residue, and the rinsate is transferred to the cylinder. The sample is then transferred to a shipping bottle, labeled, and sent to a laboratory for analysis.

At least 1 inch of water was maintained in the jars to prevent collected dust from being blown out. For the months of January through May 1987, the distilled water in the jars contained copper sulfate, an algicide, at an initial concentration of 15 milligrams per liter. For the period June through December, no copper sulfate was added because it had been determined that an algicide was not necessary (NUS, 1987c).

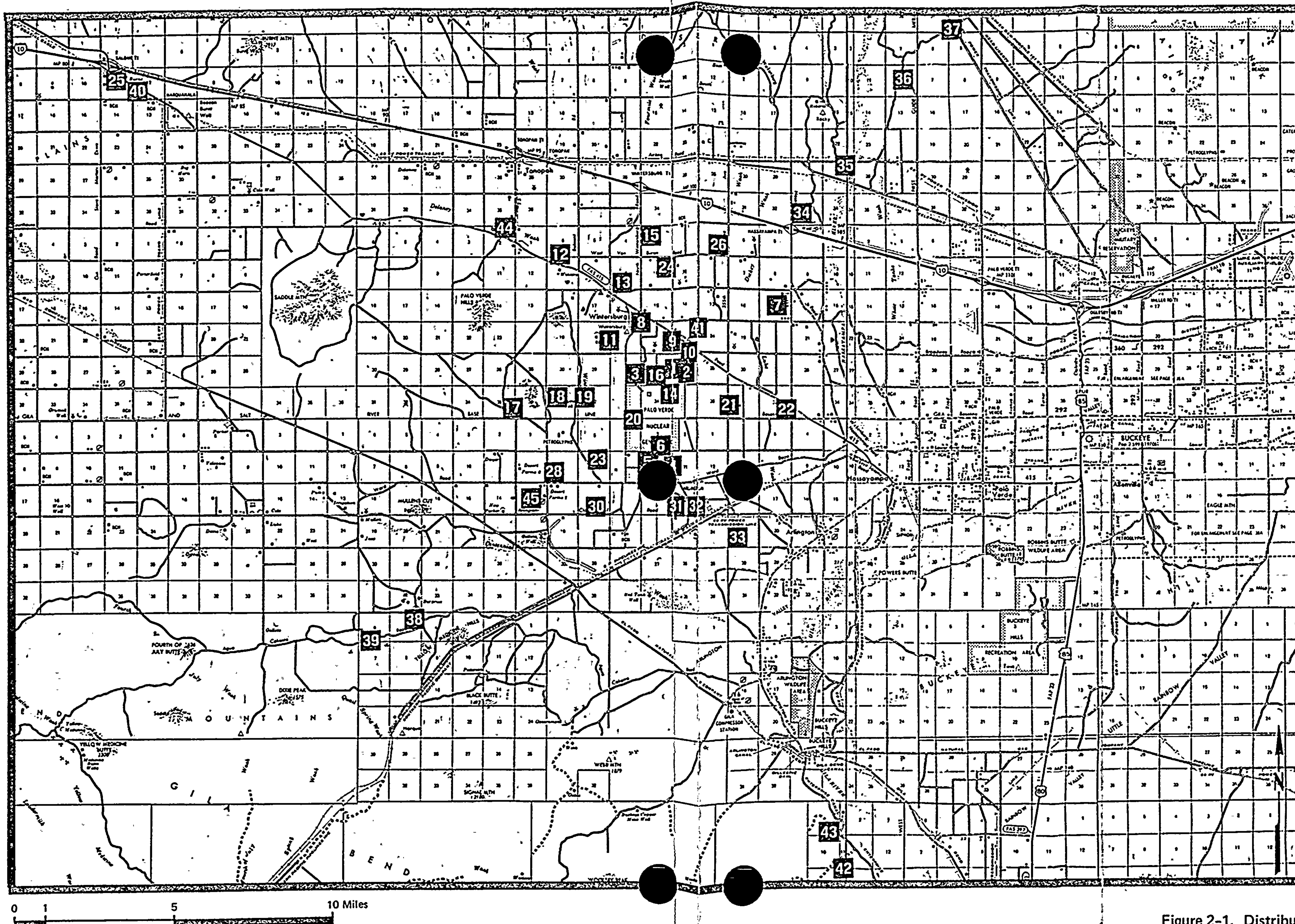

Figure 2-1. Distribution of PVNGS dustfall and soil sampling locations

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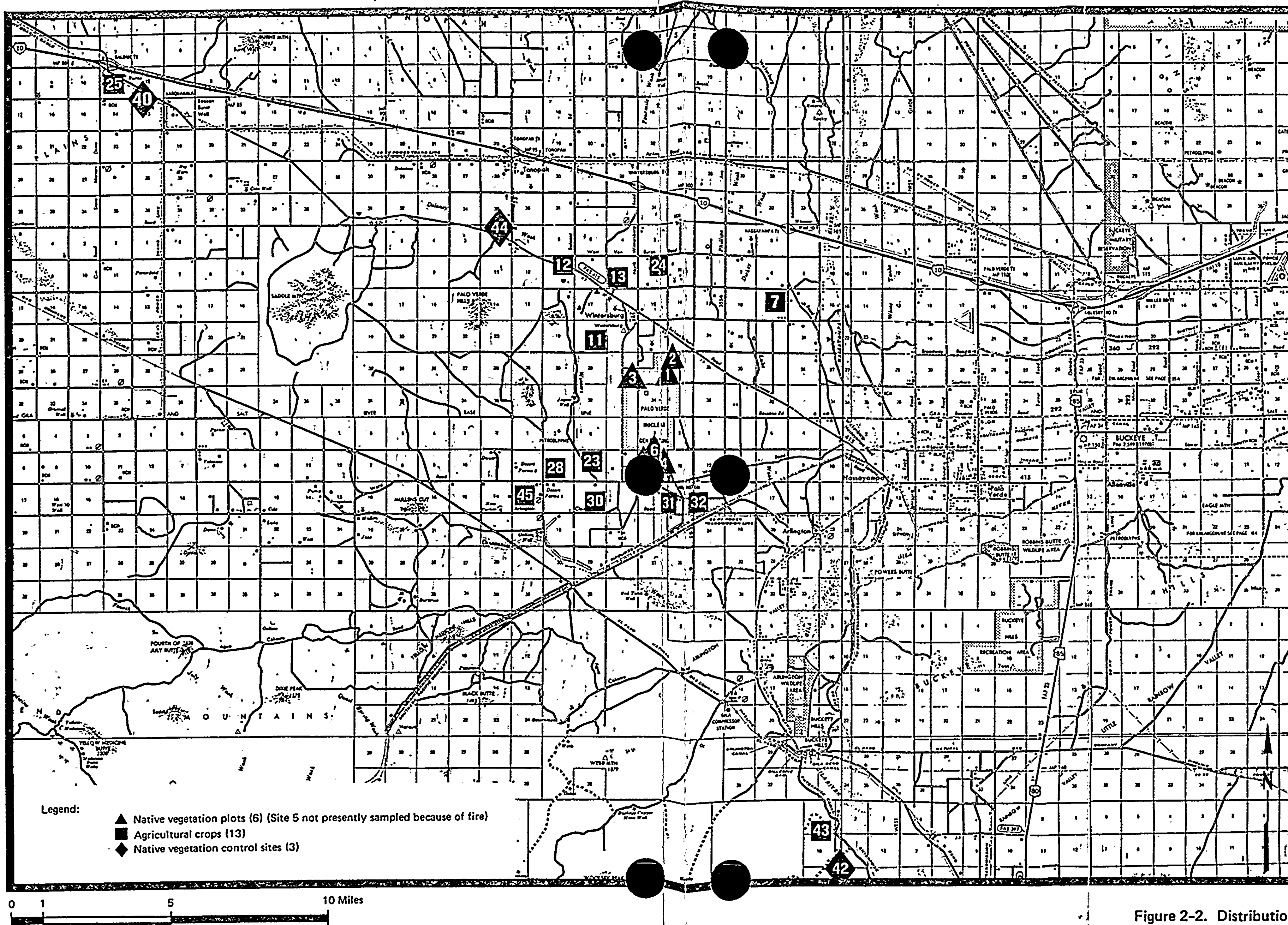

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Figure 2-2. Distribution of PVNGS vegetation sampling locations

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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, and wind speed and monthly totals of precipitation for the PVNGS site and NWS Phoenix for 1987. The PVNGS data on temperature and dew point compare reasonably well with those for NWS Phoenix. They show, for example, that NWS Phoenix is on the average about 3°F warmer than the PVNGS site. They also indicate, however, that NWS Phoenix receives considerably more precipitation than PVNGS, most of it occurring in February and December. Data losses at PVNGS due to power failures associated with thunderstorms account in part for this discrepancy. Another factor is the highly variable and localized nature of the convective storms that account for most of the precipitation in the site area, especially during the summer and fall months. Table 3-2 lists the number of days each month in 1987 when precipitation was recorded at the PVNGS site and NWS Phoenix. Most of the precipitation occurred in the summer and winter; dry periods occurred primarily in the spring.

Comparisons of 1987 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 1987 are presented as Figures 3-1

through 3-7. The depictions of annual wind direction distribution for the two levels are similar in that they reflect peak frequencies for winds from the southwest. However, a secondary peak from the north and north-northeast is evident only for the 35-foot level. This 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 are for winds from the east. Also presented on the wind roses is the frequency of calm winds, 0.1 and 0.2 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 result in a higher-than-normal frequency of nighttime cold air drainage flow. 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 1987. The majority of the occurrences were in the late winter through late summer months.

Table 3-4 presents monthly distributions of atmospheric stability classes for PVNGS for 1987 based on the delta T (i.e., the difference between the temperature at 200 feet and that at 35 feet). The distributions show a preponderance of stable classes (E, F, and G) during the fall and winter months. The unstable classes (A, B, and C) are more common in the spring and summer months. This is a normal pattern for the PVNGS site area. A more detailed description of the meteorological conditions at PVNGS during 1987 is presented in NUS-5086 (NUS, 1988a).

3.3 METEOROLOGICAL DATA RECOVERY

PVNGS meteorological data recovery for 1987 are indicated in Table 3-5. Annual data recovery for each parameter averaged 99 percent, and at no time did monthly data recovery for any parameter drop below 98 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, 1987

Month	Temperature (°F)		Dew point (°F)		Precipitation (in.)		Wind speed (mph)	
	PVNGS	NWS Phoenix*	PVNGS	NWS Phoenix*	PVNGS	NWS Phoenix*	PVNGS	NWS Phoenix†
January	50	55	27	28	0.44	0.67	4.9	6.1
February	57	60	30	33	0.51	2.06	6.9	6.6
March	61	63	27	31	0.03	0.28	7.0	6.0
April	75	78	29	36	0.00	0.09	7.7	6.7
May	79	83	40	42	0.08	0.06	7.5	7.0
June	90	93	35	40	0.00	0.01	7.1	6.0
July	90	93	43	48	0.50	1.08	7.5	6.4
August	90	92	56	57	0.43	0.45	7.6	5.9
September	84	87	45	48	0.32	0.57	6.5	4.7
October	77	81	44	49	0.85	0.47	5.5	4.1
November	59	63	36	36	0.97	1.04	5.2	4.1
December	48	53	33	33	1.33	1.62	5.1	3.9
Annual	72	75	37	40	5.46	8.40	6.5	5.6

*Based on measurement at 5 feet.

†Based on measurement at 33 feet.

Table 3-2. Number of days with precipitation events of $\geq$0.01 inch at PVNGS and NWS Phoenix, 1987

Month	PVNGS	NWS Phoenix
January	2	4
February	3	4
March	2	3
April	0	2
May	2	1
June	0	1
July	4	3
August	3	6
September	3	3
October	4	5
November	2	3
December	2	4
Average (month)	2.3	3.3

Table 3-3. Occurrences of wind gusts in excess of 50 miles per hour at PVNGS, 1987

Date	Hour ending	Occurrences during hour	Wind speed level (ft)	Probable cause
3/15	1300	1	200	Low pressure
3/15	1800	3	200	Low pressure
5/6	2000	1	200	Gust front*
7/14	1900	8	35	Gust front*
7/14	1900	19	200	Gust front*
7/14	2000	1	35	Gust front*
7/14	2000	7	200	Gust front*
7/15	2200	2	35	Thunderstorm
7/15	2200	3	200	Thunderstorm
7/26	1700	1	200	Thunderstorm
8/10	2400	3	200	Thunderstorm
10/29	1600	5†	35	Thunderstorm
10/29	1600	5†	200	Thunderstorm

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

†Power failure beginning at 1500 hours while wind speed was greater than 50 miles per hour and increasing. (Power off for 10 hours.)

Table 3-4. Monthly percent frequency distributions of stability classes based on delta T for PVNGS, 1987

Month	Stability category						
	A	B	C	D	E	F	G
January	0.00	0.67	2.02	29.03	15.73	12.37	40.19
February	2.38	2.53	5.06	30.36	14.58	16.67	28.42
March	7.39	2.82	8.47	24.06	17.20	14.78	25.27
April	7.50	10.56	10.69	19.31	16.94	12.92	22.08
May	9.41	11.29	11.16	19.35	25.67	15.46	7.66
June	9.58	11.11	11.39	16.81	17.50	19.03	14.58
July	9.95	9.27	10.75	20.97	19.49	13.98	15.59
August	8.87	9.01	12.37	21.51	28.49	11.02	8.74
September	2.64	4.58	9.58	25.42	17.36	18.33	22.08
October	0.68	3.27	6.95	27.93	16.08	12.40	32.70
November	0.00	1.53	1.95	29.71	16.60	15.90	34.31
December	0.00	0.13	1.61	29.17	15.59	17.74	35.75
Annual	4.89	5.58	7.68	24.43	18.49	15.02	23.91

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, 1987

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	100	100	99
February	100	100	100	100	100	100	97	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	100	100	100	100	100	100	100	100	100
August	100	100	100	100	100	100	100	100	100
September	100	100	100	100	100	100	100	100	100
October	98	98	98	98	98	98	98	98	98
November	99	99	99	99	99	99	99	99	99
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.

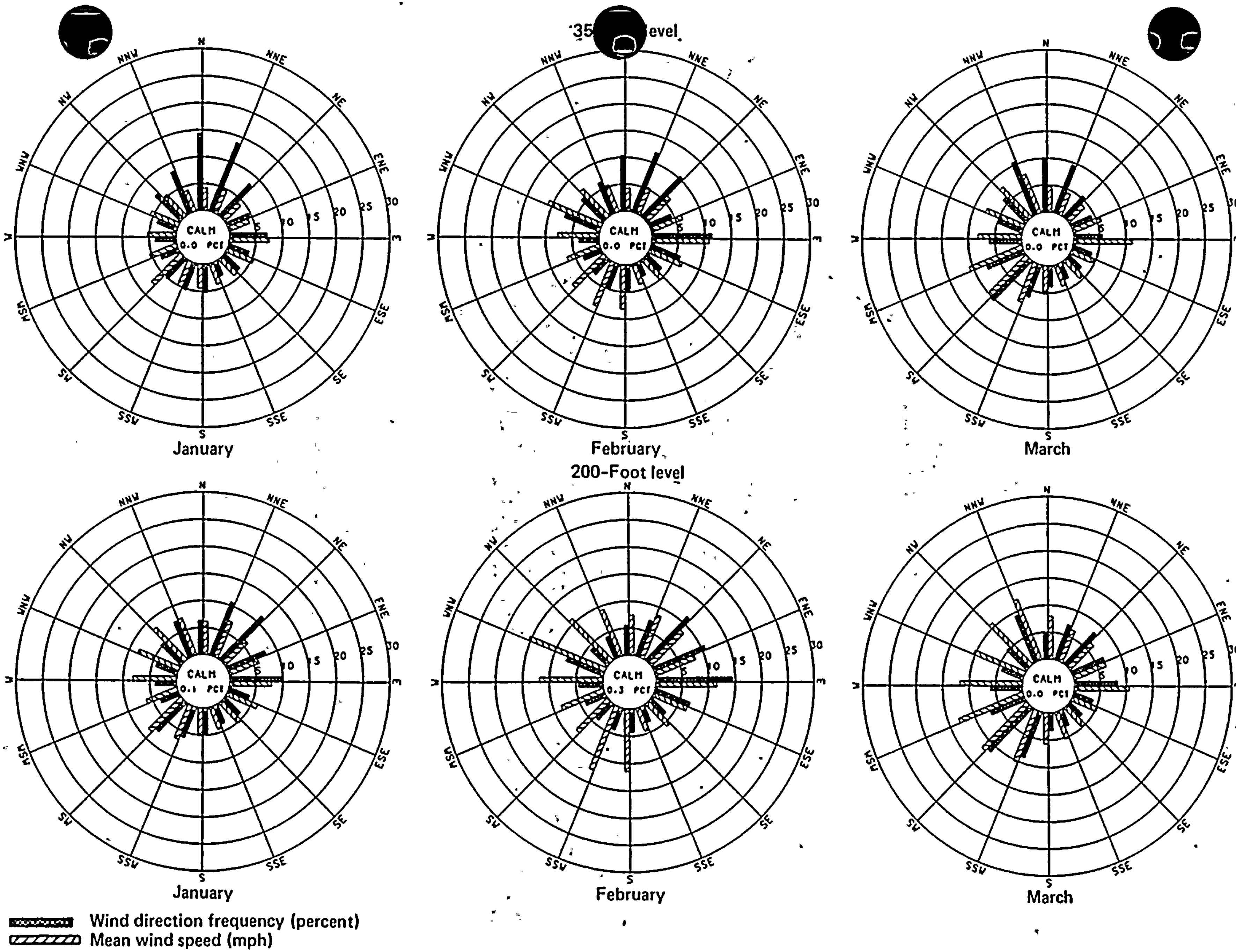
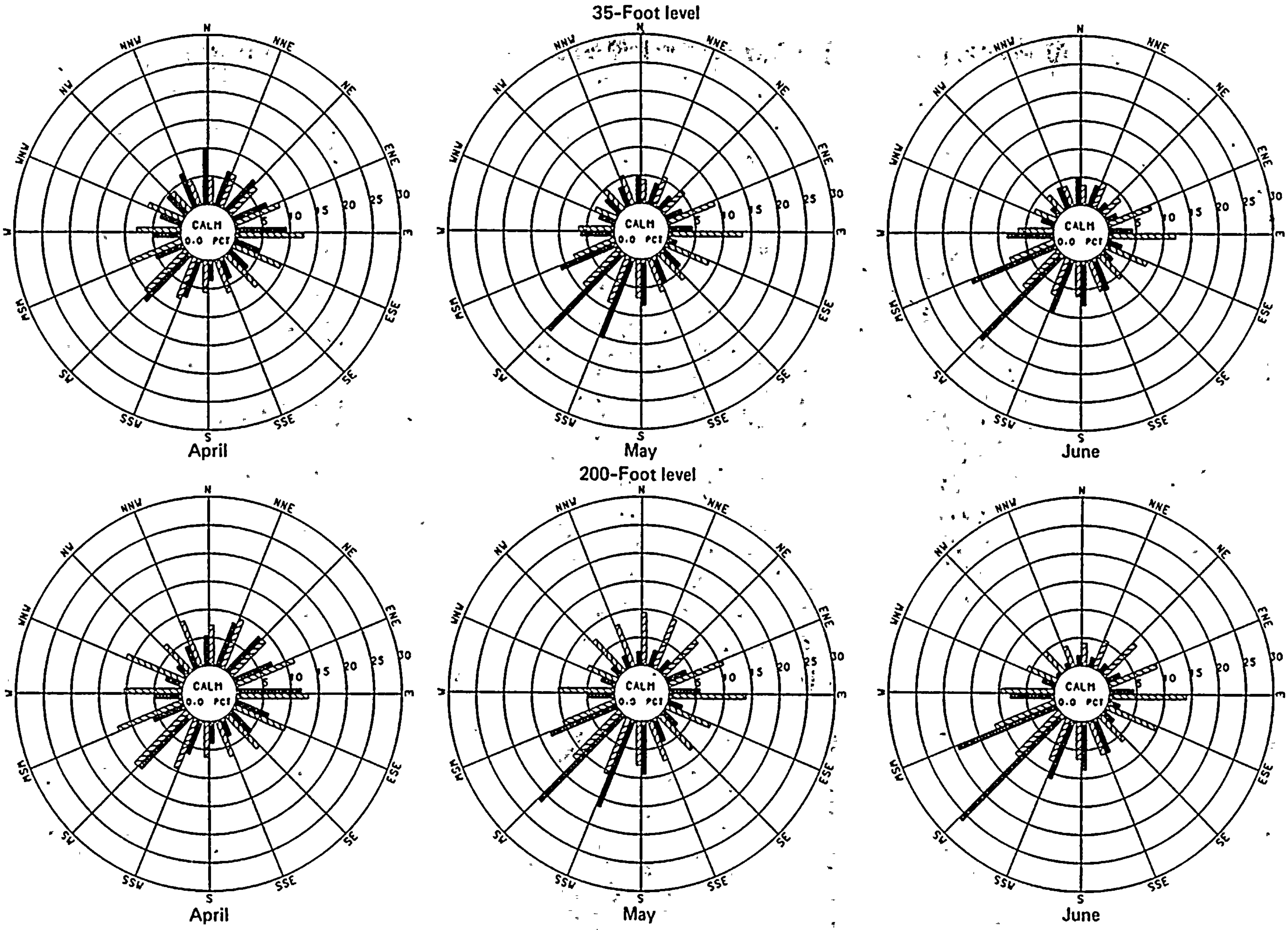


Figure 3-1. Gross wind roses for PVNGS, January, February, and March 1987



Wind direction frequency (percent)
[illegible] wind speed (mph)

Figure 3-2. Gross wind roses for [illegible]GS, April, May, and June 1987

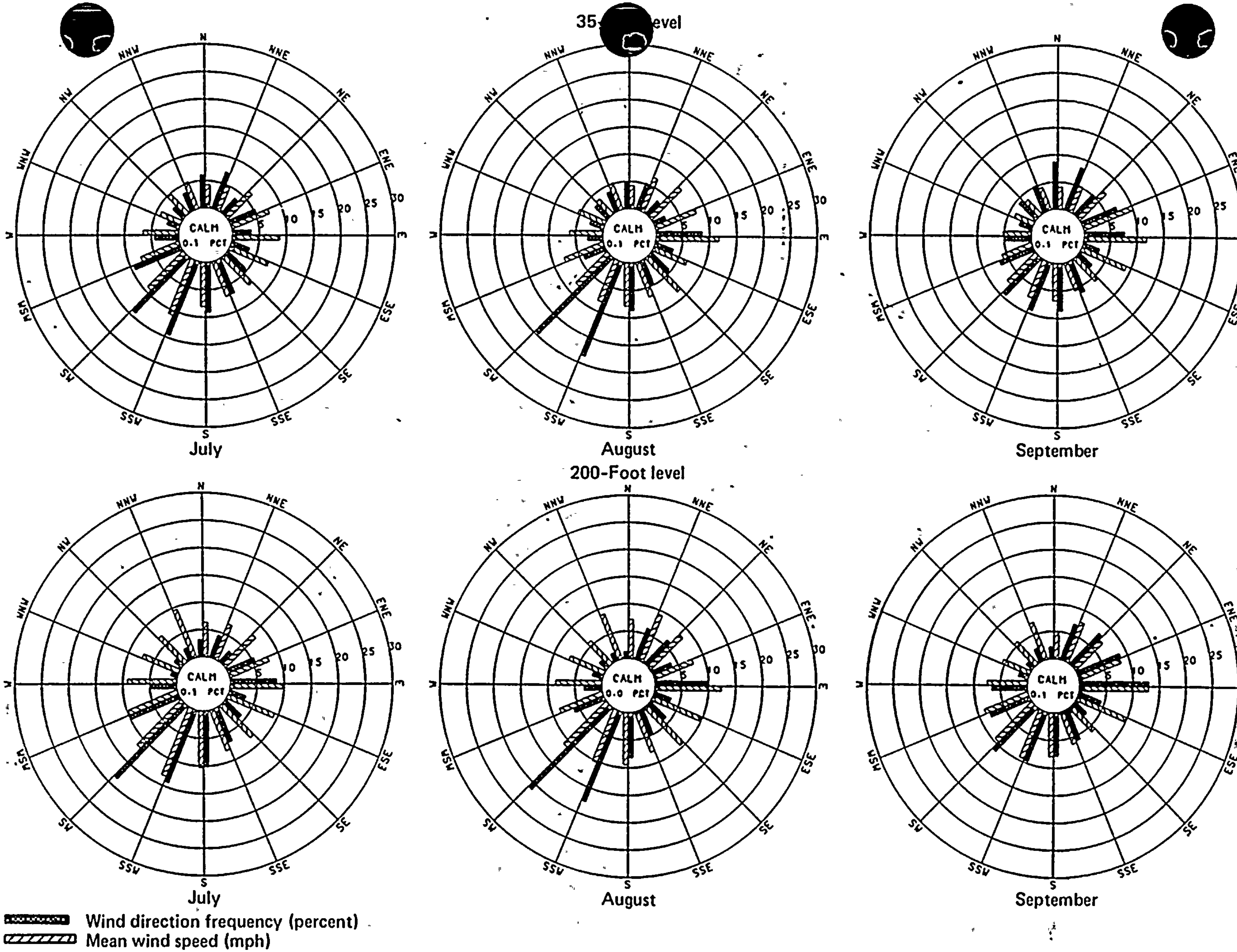


Figure 3-3. Gross wind roses for PVNGS, July, August, and September 1987

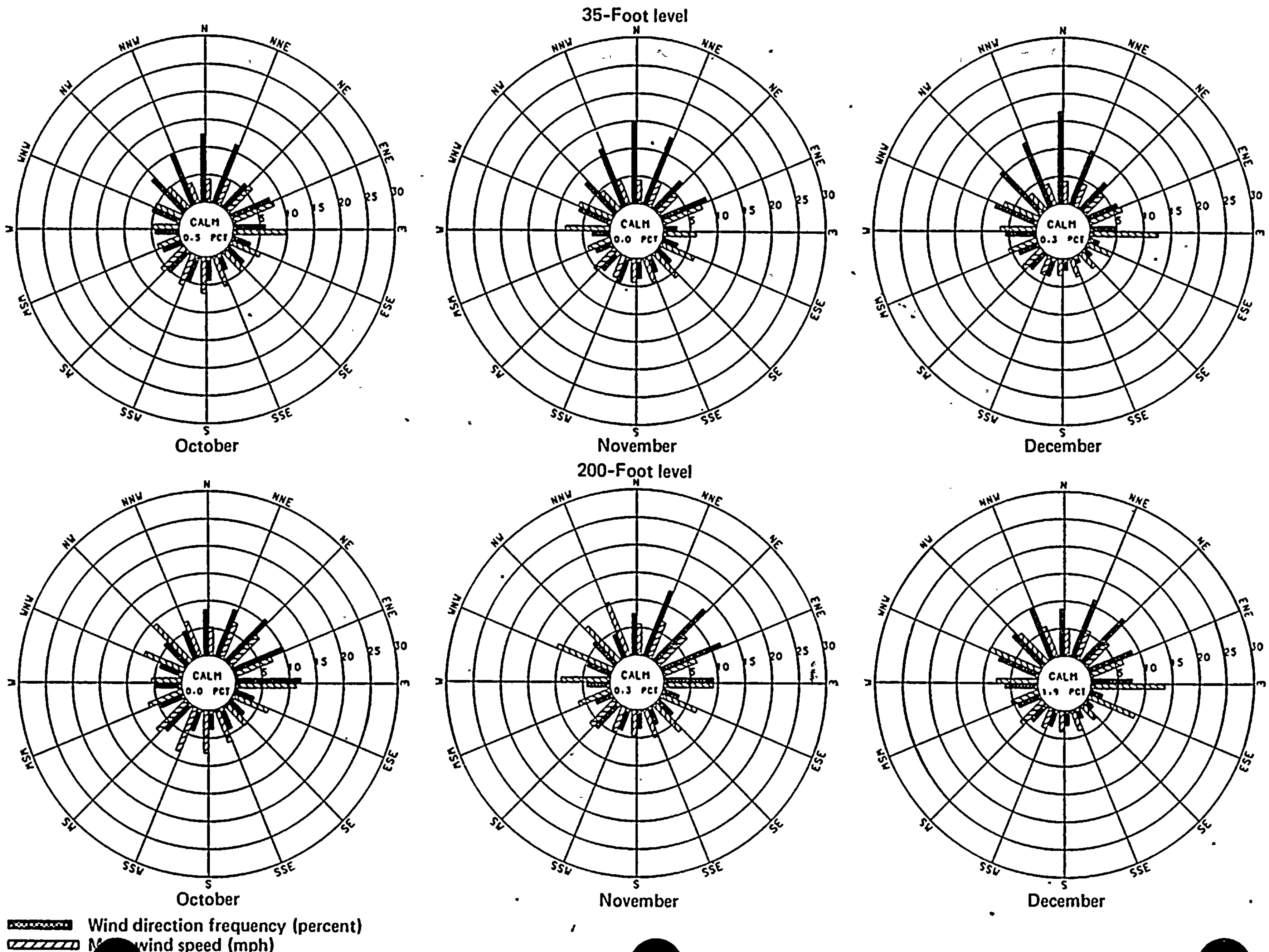


Figure 3-4. Gross wind roses for PVNGS, October, November, and December 1987

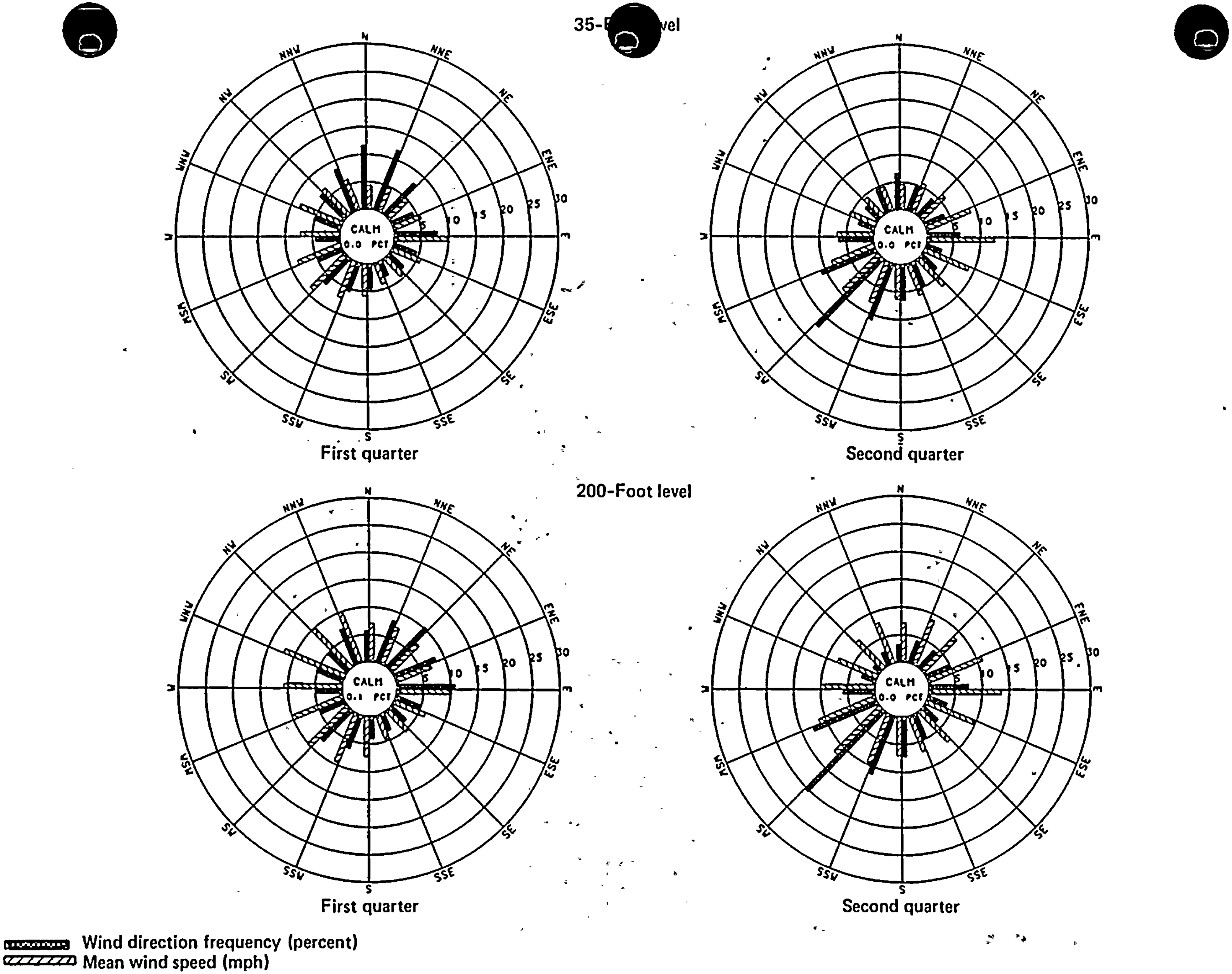
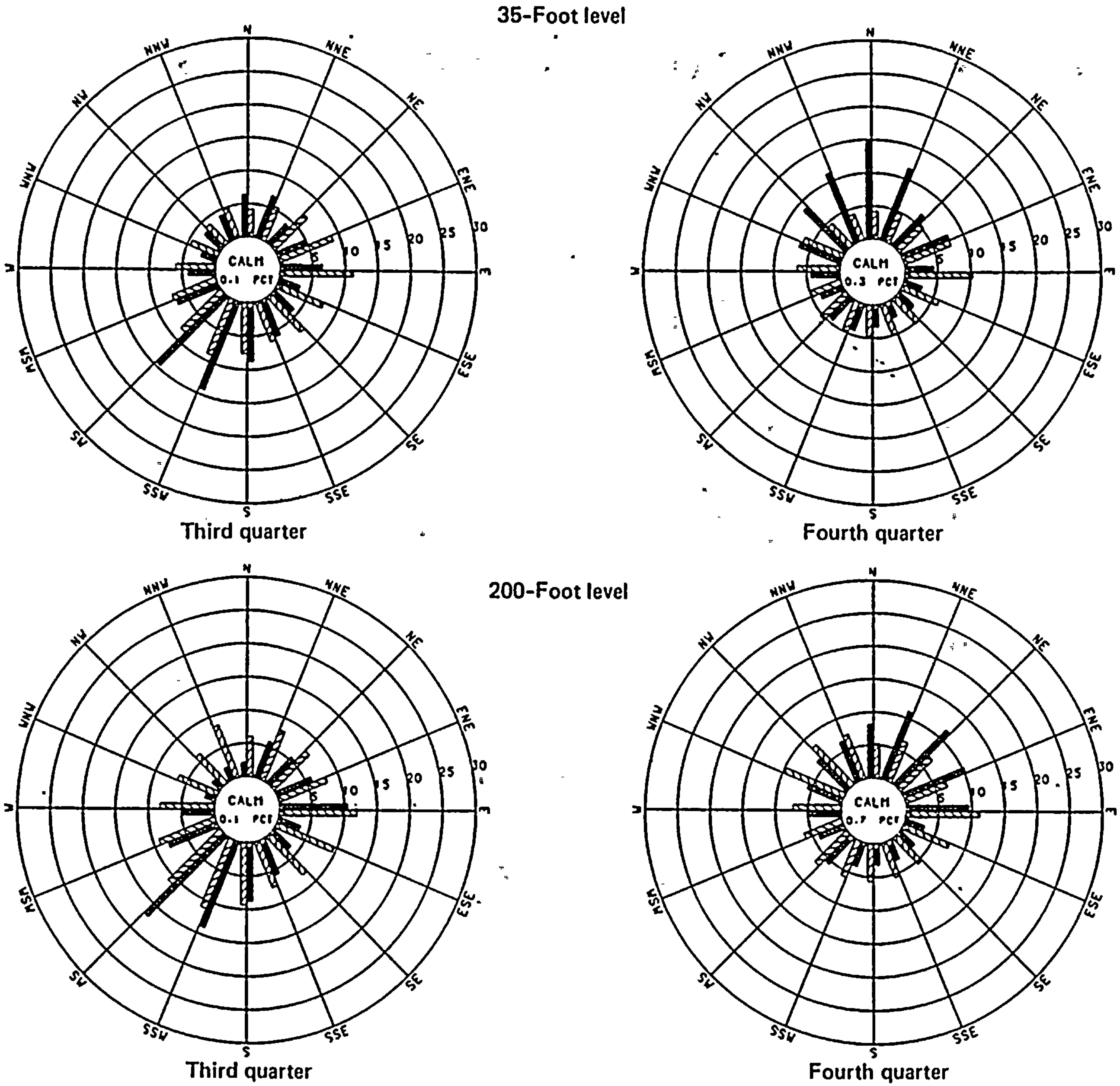
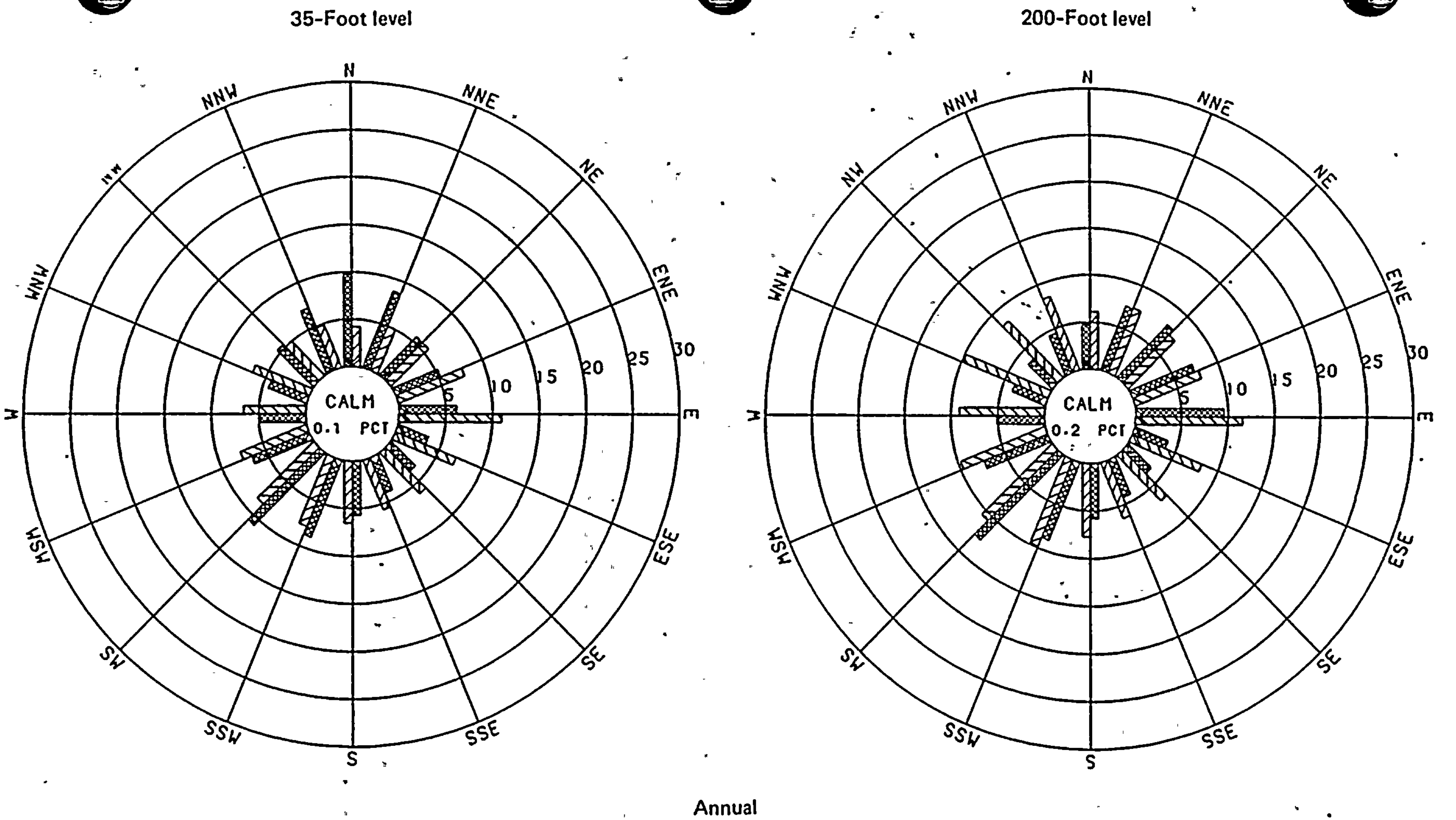


Figure 3-5. Gross wind roses for PVNGS, first and second quarters 1987



Wind direction frequency (percent)
[illegible] wind speed (mph)

Figure 3-6. Gross wind roses for PV[illegible]S, third and fourth quarters 1987



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

Figure 3-7. Gross annual wind roses for PVNGS, 1987

4 Plant Operation

4.1 COOLING TOWER OPERATION

During 1987, Units 1 and 2 of PVNGS continued commercial operation, and Unit 3 went critical in the fall and achieved full power in December. 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.

From these data, the emissions of dissolved salts per day as drift were calculated assuming a drift rate at full fan flow of 0.0002 percent of the circulating water flow rate. The drift rate was measured by two different methods (ESC, 1983), and the value used was judged to be the best estimate of the two. 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 1987. Figure 4-1 presents the thermal energy produced per month by each of the units as well as the average hourly drift emission rate from all of the units combined. 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 at each unit was sampled monthly throughout 1987 except during those months in which the unit was not operating. Thus, Unit 1 was not sampled in February, November, and December; Unit 2 was not sampled in February; and Unit 3 was sampled only in December. The objective of the sampling was to determine the buildup 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).

The coefficients of variation, although relatively large for some minor constituents (zinc, nitrate, and manganese in Unit 1; copper, nitrate, chemical oxygen demand [COD] and manganese in Unit 2), are generally smaller for the major constituents than they were in 1986, probably reflecting the greater continuity of operation in 1987 and the buffering influence of the higher total dissolved solids (TDS) content of the water supplied from the evaporation pond as makeup. TDS concentrations ranged from 5,000 to 23,000 milligrams per liter over the year; the mean values were 15,560 and 15,270 milligrams per liter for Units 1 and 2, respectively.

The annual average concentrations of 7 of the 30 analytes exceeded the average ER-OL values (PVNGS, 1979) for Units 1 and 2. These seven included sodium, chloride, sulfate, phosphate, iron, boron, and TDS. Moreover, the annual averages of nine analytes (the seven listed above plus potassium and barium) exceeded the maximum ER-OL values in one or more months of 1987.

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. With the exception of the sodium-to-potassium ratio, the coefficients of variation are considerably smaller than those for the individual ions, indicating much greater consistency in the relationship of these concentrations to one another than in the concentrations themselves.

During 1987, cooling tower makeup water was obtained both from treated Phoenix waste water and from water recycled from the evaporation pond, after treatment of both by the PVNGS water reclamation plant. The average annual effective concentration factors achieved by the cooling tower operations for Units 1 and 2 in 1987, calculated in reference to an annual mean value for

TDS in the reservoir water of 943 milligrams per liter, were determined to be about the same: 16.3.

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 (63 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 about 5.7. However, calcium would be removed from the water recycled from the evaporation pond by treatment in the water reclamation plant.

A third determination of the effective cycles of concentration was made using potassium as 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 about 19 milligrams per liter in the reservoir water, the mean annual concentrations of potassium in the cooling tower basin water (170 and 173 milligrams per liter in Units 1 and 2, respectively) would yield a mean annual concentration factor of about 9, probably the most appropriate value for this parameter.

The ratios of TDS to conductivity in cooling tower basin water samples from Units 1 and 2 displayed a consistent pattern of variations during 1987, ranging from a low of 0.58 in April to a high of 1.06 in August (both for Unit 1), as shown in Figure 4-2. Because of this variation, TDS concentrations were determined by applying the average of the Unit 1 and Unit 2 ratios for each month--except December, when the average of the Unit 2 and Unit 3 ratios was used--to the monthly mean of daily conductivity measurements for each unit. For those months for which samples or analyses were missing, the annual mean of all ratio values (0.71) 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 1987. The cooling towers for PVNGS Units 1 or 2 were in operation for the entire year except during the month of February. Those for Unit 3 began operation in December 1987.

The FOG code used sequential hourly meteorological data for 1987 obtained from the PVNGS meteorological tower system. The deposition calculations were performed for each unit 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 4-3 and 4-4 reflect the results of this drift deposition modeling for the year in onsite and offsite areas, respectively. As seen in Figure 4-3, the maximum calculated offsite deposition was about 50 pounds per acre per year along a short segment of the site boundary northeast of Unit 1. Figure 4-4 indicates that the maximum drift deposition calculated to have occurred in an agricultural area in 1987 was about 1 pound per acre about 1.5 miles northwest of the power block. The calculated monthly and annual drift deposition at each of the onsite monitoring sites is summarized in Table 4-3.

The quarter-to-quarter meteorological influence can be seen in the deposition isopleths for each quarter of 1987 presented as Figures 4-5 through 4-8. It can be noted here that, although the drift emission rates during these months were quite similar, the isopleths defining the higher deposition rates (10 pounds per acre per month and higher) tend to change significantly from quarter to quarter, expanding to the north and east during the first three quarters and to the west in the last quarter of 1987. A comparison of the predicted and measured deposition rates for 1987 is presented in Section 9.3.

Table 4-1. Power operation and cooling tower parameters for PVNGS, 1987

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 1					
January	1.12E+08†	47,179.8	3,696	5,336	5,377	364,699	15,078	0.555	0.073
February	0.00E+00	0.0	0	0	0	29,000	9,595	0.000	0.000
March	1.42E+08	60,056.7	7,399	7,582	4,499	533,301	13,904	0.712	0.096
April	2.14E+08	90,172.5	9,622	10,128	8,173	585,889	15,028	1.076	0.135
May	2.00E+08	84,360.0	9,583	9,611	8,889	581,473	15,333	1.084	0.140
June	1.89E+08	79,599.4	9,270	9,481	7,652	537,667	18,850	0.993	0.157
July	2.29E+06	965.8	0	170	252	60,613	13,645	0.014	0.002
August	1.86E+08	78,432.0	8,733	8,739	8,583	534,806	26,076	1.007	0.220
September	1.98E+08	83,423.7	9,523	9,741	9,741	584,333	23,874	1.123	0.224
October	1.10E+07	4,645.3	701	701	674	92,226	18,257	0.066	0.010
November	0.00E+00	0.0	63	63	63	29,000	15,038	0.000	0.000
December	0.00E+00	0.0	0	0	0	155,452	6,105	0.000	0.000
				Unit 2					
January	6.24E+07	26,342.1	2,668	2,940	3,049	202,118	18,734	0.331	0.044
February	0.00E+00	0.0	0	0	0	29,000	16,126	0.000	0.000
March	6.45E+07	27,202.6	4,554	2,355	1,273	417,387	13,518	0.291	0.035
April	1.99E+08	84,116.8	9,854	8,278	9,678	584,333	13,600	1.074	0.122
May	1.70E+08	71,536.1	7,222	6,943	7,004	525,774	14,646	0.820	0.102
June	1.87E+08	79,015.7	8,960	7,744	8,306	570,333	18,123	0.959	0.144
July	2.04E+08	86,062.7	9,059	9,005	9,039	589,000	17,507	1.051	0.152
August	2.15E+08	90,560.0	9,652	9,624	9,645	589,000	24,103	1.121	0.226
September	2.11E+08	89,021.8	9,586	9,643	9,657	589,000	20,231	1.120	0.189
October	2.14E+08	90,151.2	8,957	10,108	9,903	589,000	19,898	1.123	0.186
November	1.90E+08	80,023.7	7,533	8,848	7,905	575,000	17,653	0.937	0.139
December	2.14E+08	90,300.6	8,991	8,549	5,574	589,000	13,038	0.896	0.097
				Unit 3					
December	9.40E+07	39,670.2	2,423	2,879	1,620	473,086	8,273	0.241	0.018

*Based on drift rate at full fan flow of 0.0002 percent of circulating water flow.

†1.12E+08 = 1.12×10^8.

Table 4-2. Chemical composition of cooling tower basin water at PVNGS, 1987 (sheet 1 of 2)

Analyte	Unit 1 Average	Unit 1 Range	Unit 1 COV*	Unit 2 Average	Unit 2 Range	Unit 2 COV*	Unit 3 (December value)	Design-basis value (ER-OL Table 3.6-1)
				Concentrations†				
Calcium, total	368	230-490	0.25	350	160-500	0.34	280	420.0
Magnesium, total	42.3	27-51	0.20	38	11-50	0.29	30	150.0
Sodium, total	5,256	3,400-7,000	0.22	5,118	1,600-7,900	0.36	4,700	3,375.0
Chloride	5,144	3,400-7,300	0.27	5,418	1,900-8,100	0.37	5,200	2,400.0
Sulfate (as SO_4)	4,856	3,400-6,100	0.20	4,791	1,500-7,100	0.34	3,900	2,250.0
Nitrate (as N)	218	170-290	0.20	201	50-310	0.40	140	1,650.0
Silica (as SiO_2)	44	11-66	0.41	37	4-71	0.61	30	150.0
Phosphate	3.4	2.1-5.7	0.40	2.8	0.41-6.1	0.57	1.5	1.5
Fluoride	19.1	13-29	0.27	20	6.3-32	0.37	18	52.5
Potassium, total	170	91-260	0.34	173	67-310	0.55	240	207.0
Copper, total	0.119	0.055-0.240	0.47	0.158	0.068-0.380	0.71	0.670	0.3
Zinc, total	0.174	0.053-0.490	0.76	0.100	0.056-0.190	0.48	0.100	1.0
Iron, total	0.547	0.27-1.10	0.45	0.59	0.28-1.00	0.39	1.20	0.075
Arsenic, total	0.020	<0.050-0.031	0.31	0.016	<0.005-0.017	0.45	0.011	0.12
Boron	6.84	1.8-10.0	0.43	6.6	2.4-11.0	0.43	6.4	0.56
Ammonium (as N)	1.81	0.3-8.0	1.39	1.0	<0.2-4.7	1.33	0.4	75.0
TSS (at 105°C)	52.0	29-84	0.31	64	13-170	0.73	37	150.0
COD	282	150-360	0.23	489	32-2,300	1.29	180	1,305.0
Alkalinity, total	47.0	8-94	0.58	44	13-100	0.61	22	1,500.0
TDS (at 180°C)	15,556	11,000-21,000	0.22	15,273	5,000-23,000	0.35	14,000	12,000.0
Silver, total	0.011	<0.005-0.060	1.83	0.011	<0.005-0.050	1.52	0.012	0.05
Barium, total	0.144	<0.2-0.3	0.50	0.146	<0.2-0.3	0.56	0.1	0.15
Cadmium, total	0.004	<0.005-<0.025	0.92	0.005	<0.005-0.013	0.86	<0.005	0.015
Chromium, total	0.033	<0.025-0.061	0.50	0.034	0.021-0.061	0.41	0.030	0.06
Lead, total	0.026	<0.005-0.060	0.55	0.034	<0.05-0.18	1.45	<0.025	0.3
Mercury, total	0.0003	<0.0010-0.0012	1.33	0.0004	<0.0010-0.0018	1.50	0.0001	0.0015
Beryllium, total	0.0039	<0.005-0.005	0.85	0.004	<0.005-0.007	0.84	<0.005	0.3
Selenium, total	0.028	<0.100	0.30	0.0028	<0.05-0.035	0.28	<0.005	0.015

Table 4-2. Chemical composition of cooling tower basin water at PVNGS, 1987 (sheet 2 of 2)

Analyte	Unit 1 Average	Unit 1 Range	Unit 1 COV*	Unit 2 Average	Unit 2 Range	Unit 2 COV*	Unit 3 (December value)	Design-basis value (ER-OL Table 3.6-1)
Concentrations (continued)								
Manganese, total	0.043	0.018-0.160	1.05	0.032	<0.025-0.11	0.85	0.110	0.75
Phenol	0.014	0.006-0.029	0.56	0.012	<0.002-0.020	0.51	0.006	0.14
Conductivity (μmhos/cm)	20,750	17,000-29,000	0.21	21,690	7,900-40,000	0.43	27,000	--
Ion ratios								
Sodium/potassium	36.05	--	0.54	34.29	--	0.52	19.58	--
Sodium/calcium	14.47	--	0.12	14.72	--	0.23	16.79	--
Sodium/magnesium	124.83	--	0.15	134.70	--	0.20	156.67	--
Sodium/nitrate	24.52	--	0.21	26.64	--	0.21	33.57	--
Sodium/chloride	1.04	--	0.08	0.95	--	0.13	0.90	--
Sodium/sulfate	1.09	--	0.14	1.07	--	0.16	1.21	--

Key: COV, coefficient of variations; NA, not applicable; TSS, total suspended solids; COD, chemical oxygen demand; TDS, total dissolved solids; ND, not detected: -- (dash), not determined.

*Standard deviation/mean.

†In milligrams per liter except where otherwise indicated.

Table 4-3. Predicted drift deposition (lb/(acre)(yr)) at PVNGS onsite monitoring locations, 1987

Site	Monthly deposition Jan	Feb*	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual deposition
1	0.36	--	0.35	0.45	0.77	1.1	0.22	1.3	0.81	0.18	0.14	0.14	5.8
2	0.35	--	0.31	0.29	0.43	0.61	0.14	0.60	0.45	0.077	0.11	0.061	3.4
3	0.71	--	0.51	0.96	0.90	0.77	0.70	2.0	0.92	0.61	0.74	0.44	8.8
4	0.13	--	0.32	0.22	0.14	0.073	0.015	0.079	0.13	0.043	0.014	0.027	1.2
5	0.053	--	0.05	0.03	0.028	0.0091	0.035	0.019	0.044	0.064	0.029	0.056	0.42
6	0.034	--	0.06	0.064	0.027	0.027	0.024	0.025	0.039	0.081	0.058	0.088	0.58
10	0.19	--	0.18	0.11	0.30	0.41	0.083	0.42	0.26	0.080	0.069	0.050	2.2
14	1.5	--	2.0	2.8	4.9	4.9	0.68	6.8	3.5	0.49	0.52	0.28	28.0
16	2.0	--	2.1	6.6	10.0	14.0	8.8	22.0	17.0	4.0	2.0	1.0	90.0
20	1.7	--	1.2	3.9	1.6	0.94	2.9	3.0	6.9	6.5	5.6	2.3	36.0
27	0.12	--	0.14	0.24	0.13	0.074	0.01	0.10	0.17	0.071	0.038	0.025	1.1
80	2.4	--	6.3	13.0	23.0	25.0	5.3	43.0	18.0	2.1	1.9	1.0	140.0
81	7.0	--	9.0	42.0	48.0	72.0	57.0	130.0	87.0	28.0	6.4	3.2	510.0
82	2.7	--	2.2	5.5	1.5	1.1	2.4	6.8	8.8	8.0	6.0	4.2	48.0
83	2.8	--	7.9	6.1	3.7	3.1	1.7	6.4	6.7	5.9	3.3	3.6	49.0

*Units 1 and 2 not in operation.

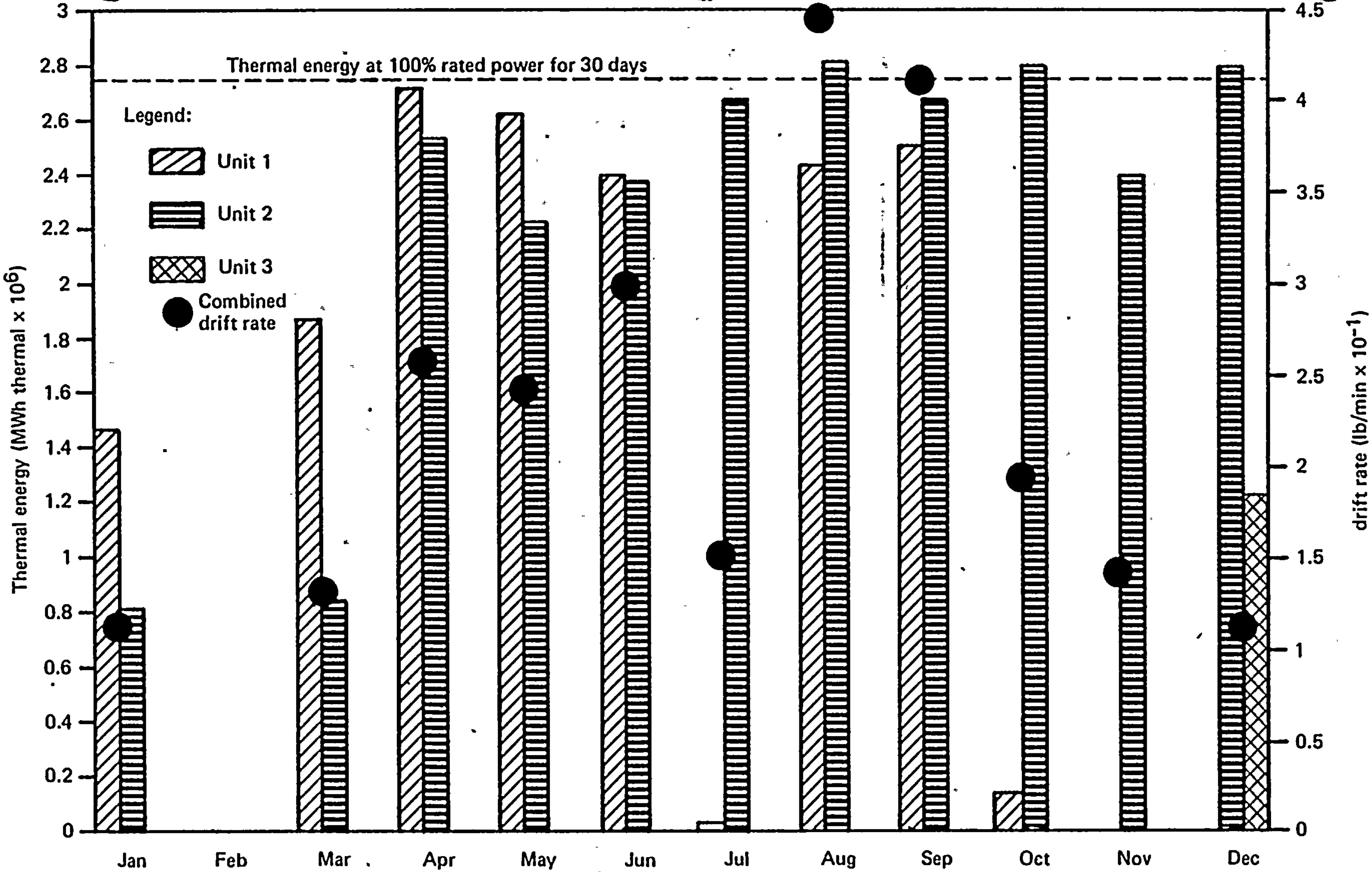


Figure 4-1. Thermal energy generation and drift rate for cooling towers at PVNGS, 1987

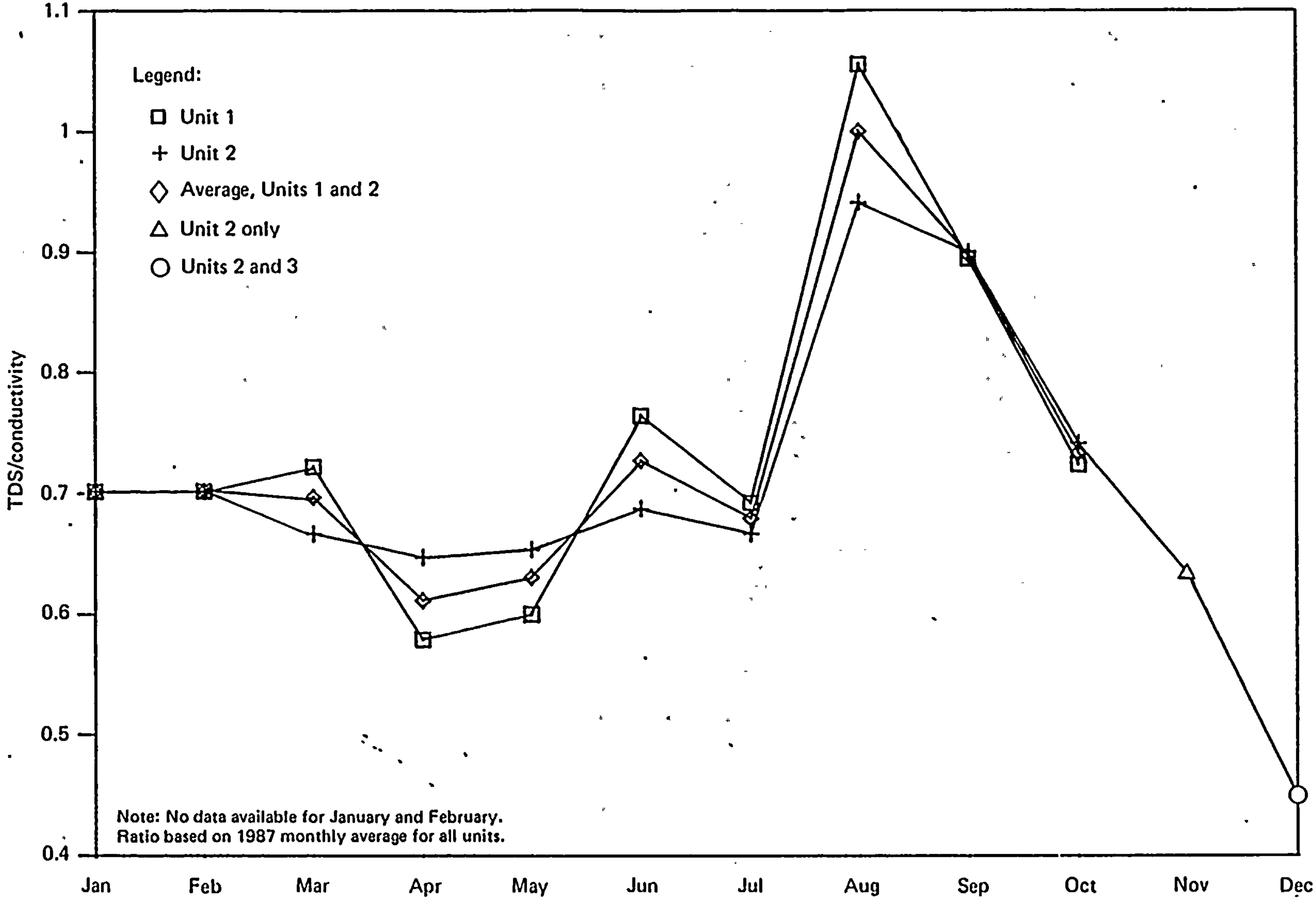


Figure 4-2. Ratio of total dissolved solids (TDS) to conductivity for cooling tower basin water at PVNGS, 1987

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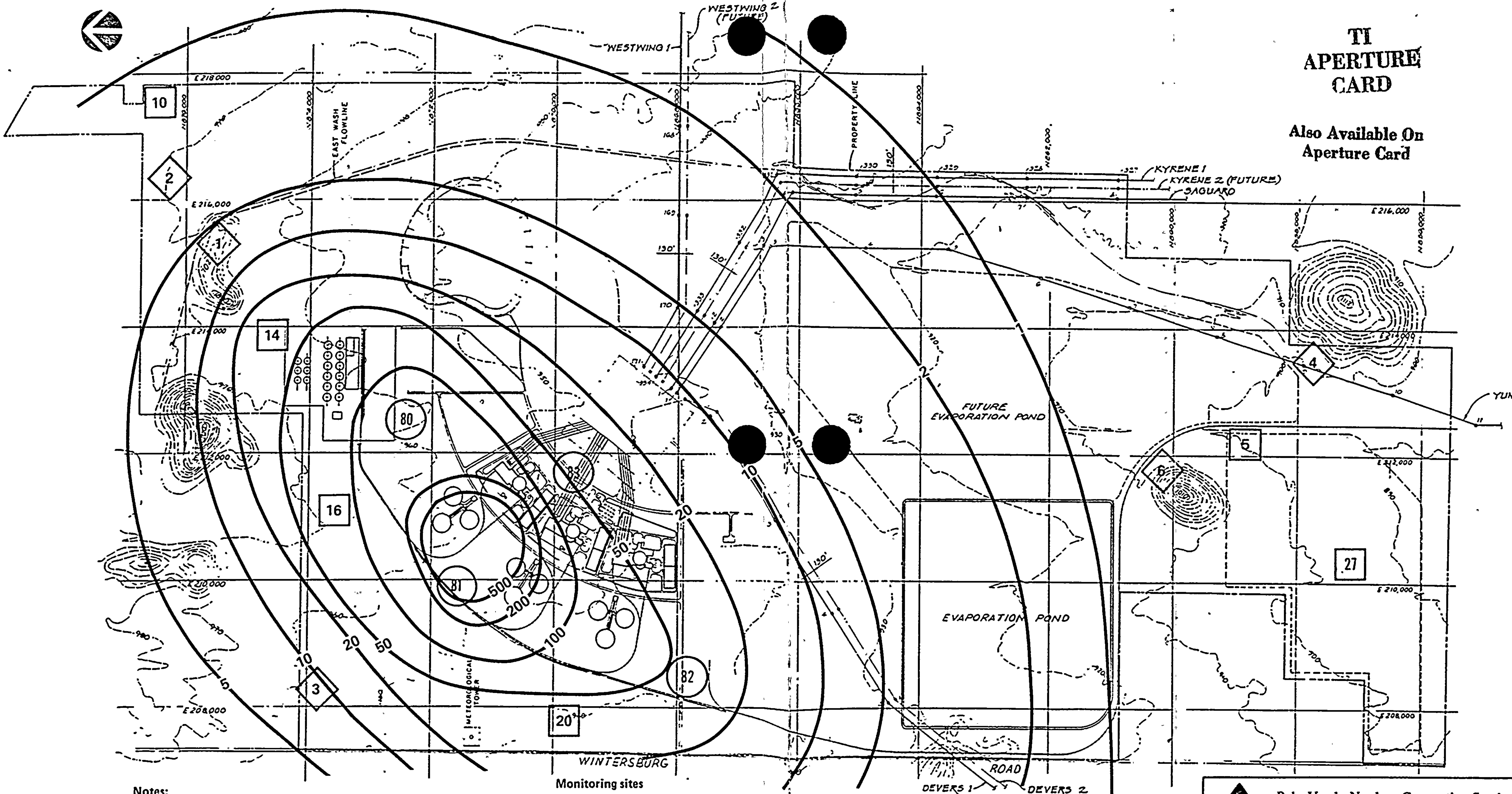

Notes:
PVNGS 16-bin spectra
01/01/87 - 12/31/87
0.0002% Drift rate
3 Units (9 towers)
Total drift deposition, lb/(acre)(yr)

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

Palo Verde Nuclear Generating Station

Figure 4-3

FOG code predictions of 1987 onsite drift deposition for PVNGS Units 1, 2, and 3

8805100358-03

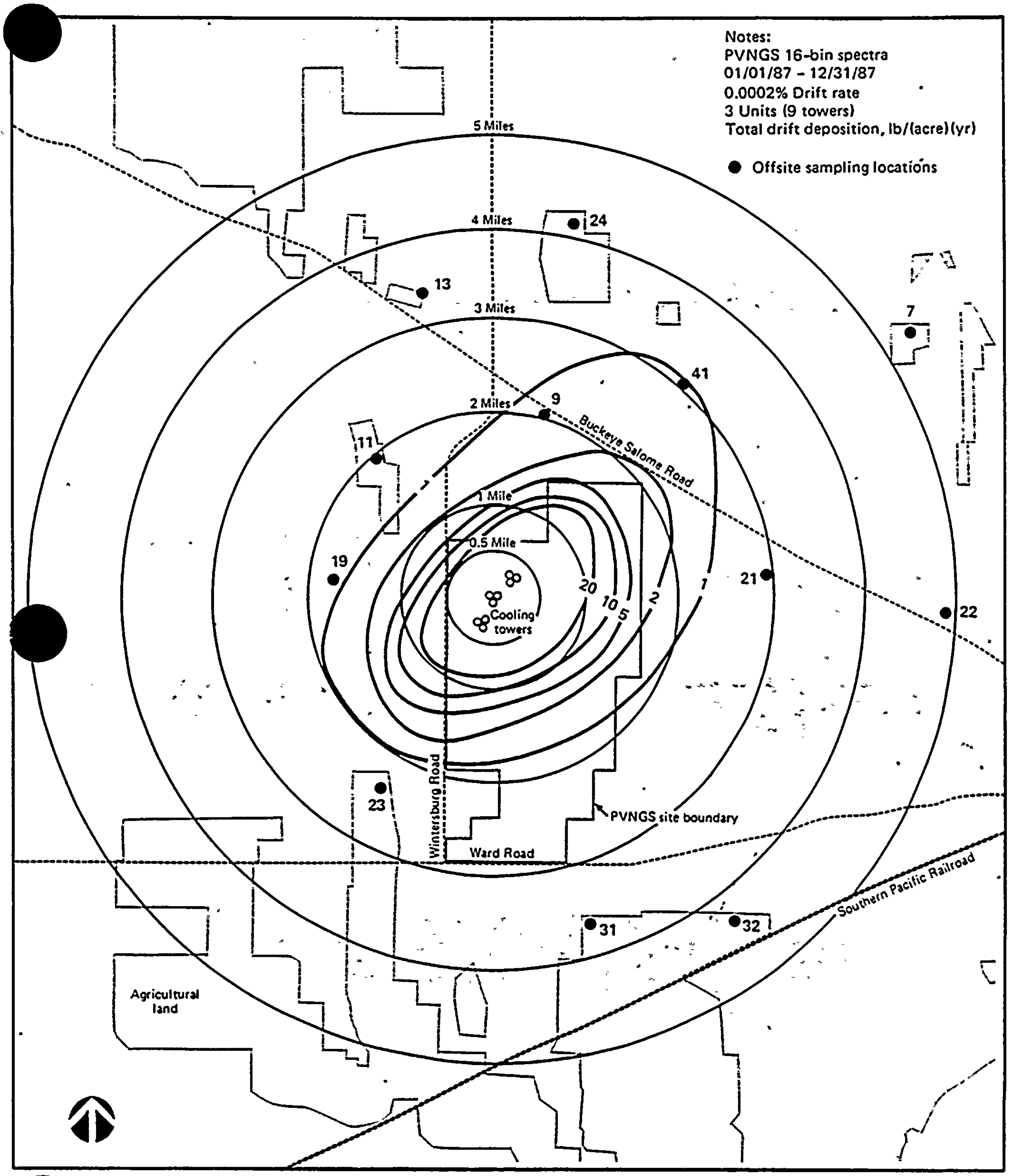

Figure 4-4. FOG code predictions of 1987 offsite drift deposition for PVNGS Units 1, 2, and 3

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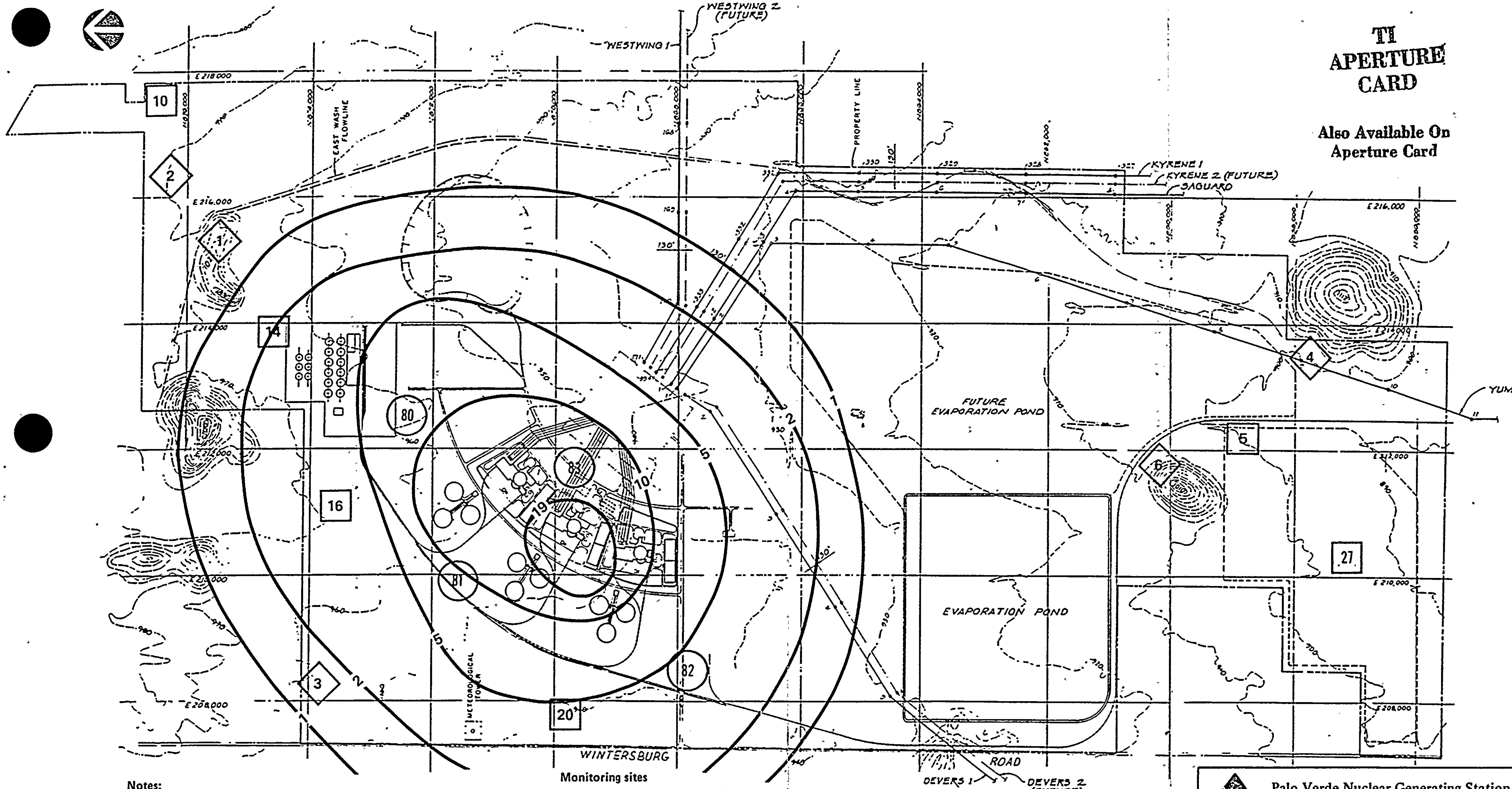

Notes:
PVNGS 16-bin spectra
01/01/87 - 03/31/87
0.0002% Drift rate
2 Units (6 towers)
Total drift deposition, lb/(acre)(quarter)

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

600 0 600 1200 Feet

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Figure 4-5

FOG code predictions of first quarter 1987 onsite drift deposition for PVNGS Units 1 and 2

8805100358-04

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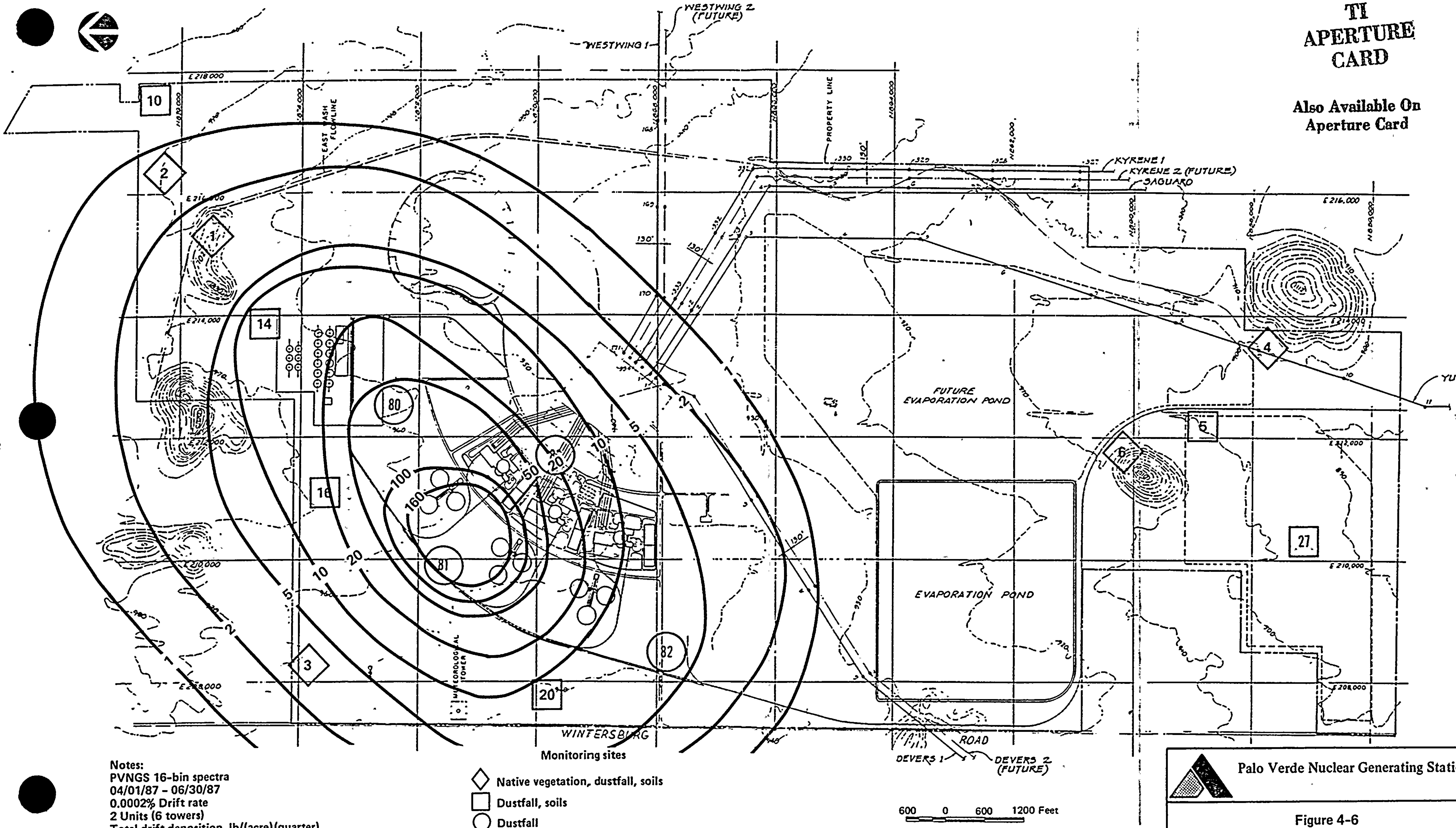

Notes:
PVNGS 16-bin spectra
04/01/87 - 06/30/87
0.0002% Drift rate
2 Units (6 towers)
Total drift deposition, lb/(acre)(quarter)

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Figure 4-6

FOG code predictions of second quarter 1987 onsite drift deposition for PVNGS Units 1 and 2

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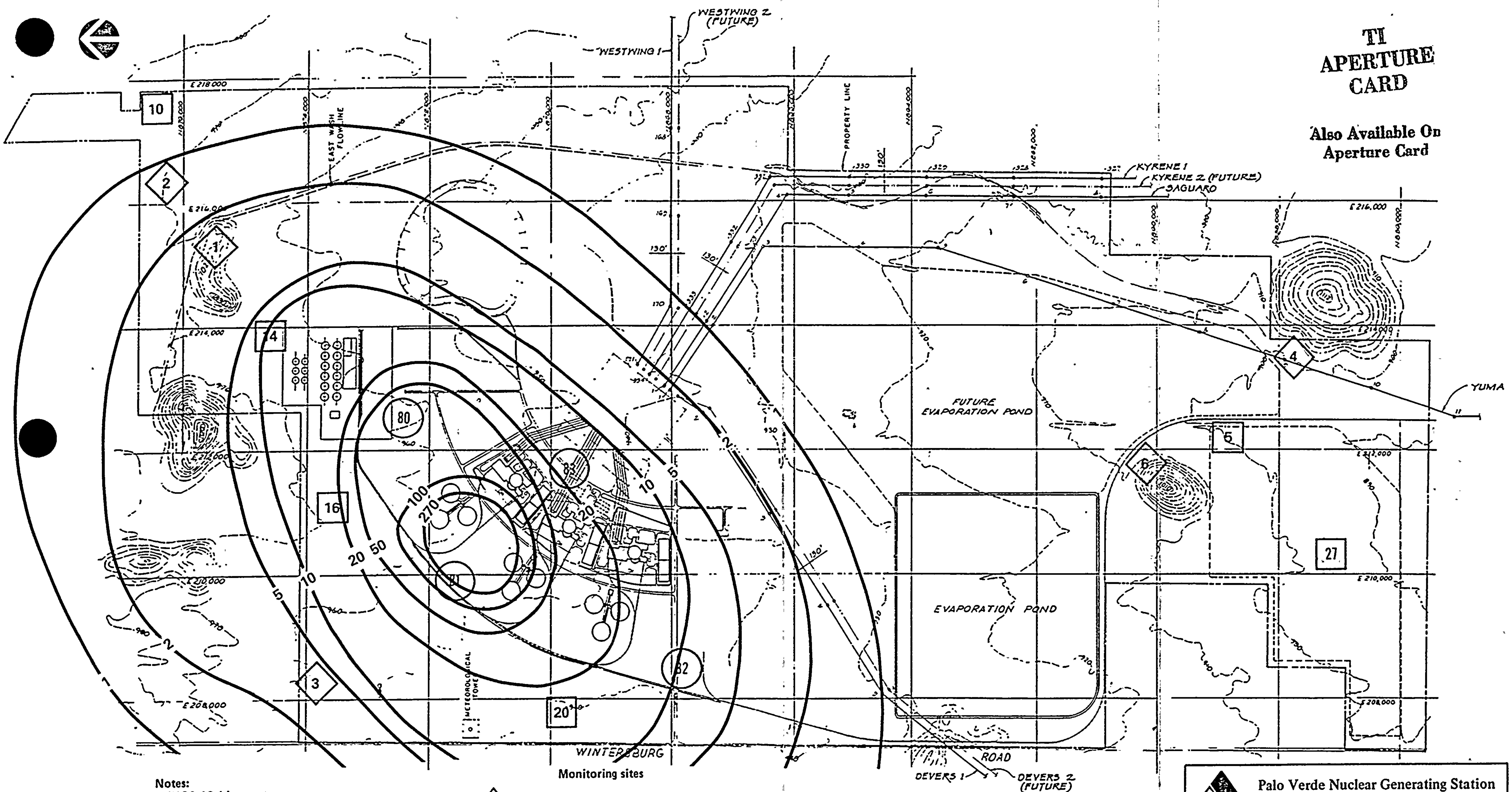

Notes:
PVNGS 16-bin spectra
07/01/87 – 09/30/87
0.0002% Drift rate
2 Units (6 towers)
Total drift deposition, lb/(acre)(quarter)

Monitoring sites

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

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Figure 4-7

FOG code predictions of third quarter 1987 onsite drift deposition for PVNGS Units 1 and 2

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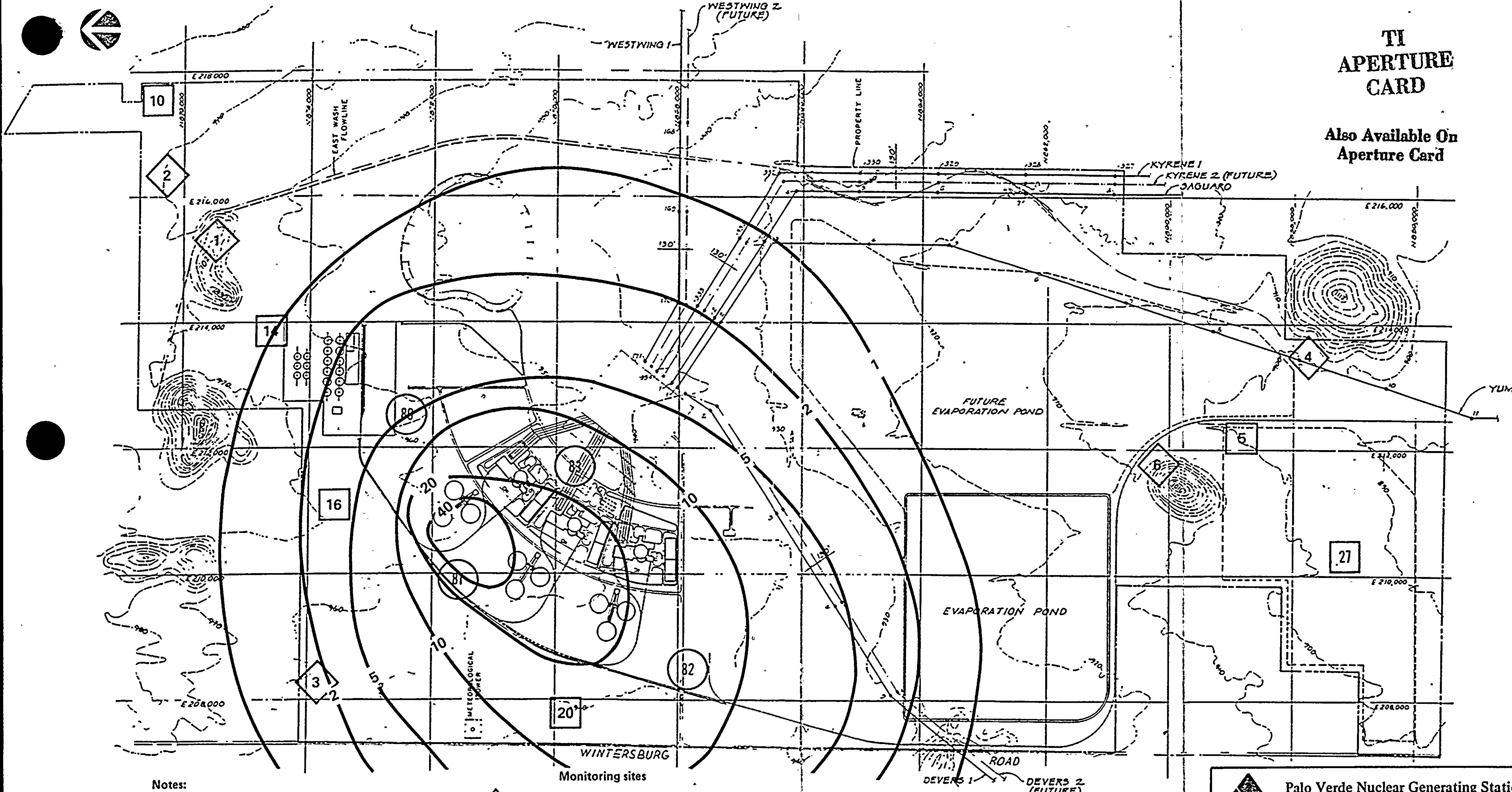
TI APERTURE CARD

Also Available On Aperture Card



Notes:
PVNGS 16-bin spectra
10/01/87 - 12/31/87
0.0002% Drift rate
3 Units (9 towers)
Total drift deposition, lb/(acre)(quarter)

Monitoring sites

- Native vegetation, dustfall, soils
- Dustfall, soils
- Dustfall

600 0 600 1200 Feet

Palo Verde Nuclear Generating Station

Figure 4-8

FOG code predictions of fourth quarter 1987 onsite drift deposition for PVNGS Units 1, 2, and 3

8805100358-07

5 Salt Deposition

5.1 INTRODUCTION

In order to monitor the amount of drift deposition in the area surrounding PVNGS, samples collected during 1987 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 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 dustfall 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 significant results for the 12-month monitoring period of January to December 31, 1987. 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 detectable limit of the laboratory analytical procedures. Of the 14 parameters measured in each sample, fluoride, carbonate, and ammonium were routinely below their analytical detection limits.

Detection limits for the analyzed parameters are provided 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 available for analysis consists of the water remaining in the collector at the end of the month and the rinse water. The volume of water remaining in a collector at the end of the month varies with the season. The amount of rinse water necessary to clean the dust from the collector depends on the amount of dust collected. 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 with negative signs to indicate that the actual values are less than those listed.

Although sulfate is an ion of interest and was measured at concentrations well above its detection limit from January through June, the sulfate measured derived largely from copper sulfate added to the collection water as an algicide. The nominal "deposition," based on the initial concentration of the algicide and nominal collection water volume at the end of the sampling month, was approximately 13.5 pounds per acre per month. The copper concentration is used as yet another indicator of the efficiency of the sample collection and processing steps, and the amounts measured do not represent actual copper deposition from drift deposition. Neither of these ions was statistically analyzed further. The addition of copper sulfate as an algicide was discontinued in June 1987 after studies indicated that it was unnecessary (NUS, 1987c).

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, five (sites 7, 12, 24, 28, and 32) were fallow during the 1987 growing season. The deposition measured at these five locations was probably less than it would be during periods of cultivation.

5.2.2 Drift Deposition Results

The method for analyzing the 1987 deposition data was modified to better represent the observed data. In previous years, the mean deposition for a particular monitoring location was taken as the average of the two colocated samples. Values below the detection limit were considered missing. However, in 1987, each colocated 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, nitrate, and TSS were analyzed statistically to determine the spatial and temporal variations of the data. (Because of their importance, nitrate and TSS were included in the statistics even though slightly more than 25 percent [27 and 28 percent, respectively] of the data were below the detection limit.)

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 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. Based on analyses using a t-test, the mean deposition values for all ions except sodium and chloride 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 for all ions but sodium and chloride. 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 of most ions throughout the study area during the report year was large. This can be attributed primarily to wet and dry season fugitive dust trends and to seasonal agricultural practices that release varying amounts of settleable dust into the atmosphere. Most ions had higher deposition in the summer months and lower deposition in the winter.

Table 5-3 presents an analysis of the deposition of three of the primary ions (sodium, potassium, and calcium) in the cooling tower basin water at each agricultural site. Sodium at sites 23, 30, 43, and 45 was significantly higher than at the seven other agricultural sites, of which five (sites 7, 12, 24, 28, and 32) were fallow during 1987. Potassium at sites 23 and 30 was significantly higher for the year than at the other 11 agricultural sites. This may be attributable to agricultural activity. Site 23 also showed significantly higher deposition rates of calcium than any other agricultural monitoring site. Site 30 showed significantly higher deposition rates of calcium than any other agricultural monitoring site with the

exception of site 23. As with sodium, the agricultural activity at sites 23 and 30 is probably the primary cause for increased calcium.

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 site 7 (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 the 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 most ions throughout the study area during the year was large. Most ions had maxima in the late summer months and minima in March and April. Sodium and chloride showed increases in January and December. The December maximum coincided with the initiation of full power for Unit 3, but, according to the drift emission data presented in Figure 4-1, the two events were probably unrelated. 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 primary ions (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 ions for each native site. For sodium, the deposition at site 81 was significantly greater (32 pounds per acre per year) than at all other native sites. Of all monitoring sites, site 81 is the closest to the cooling towers for Units 1 and 2 (see Figure 4-2). The analyses for calcium indicate that the annual deposition at site 14 was significantly greater than that of any of the other sites. Site 14 is immediately west-northwest of the sludge landfill and is probably affected by the fugitive emissions from that location and the associated vehicular traffic. Similarly, site 80, which had significantly higher calcium deposition than most other sites, is just southwest of the sludge landfill. Also, sites 1, 6, 16, 81, 82, and 83 had mean

annual calcium deposition significantly higher than the means at most of the other sites. All of these sites are on the PVNGS site.

Figures 5-5 and 5-6 provide the mean monthly deposition for the four supplemental sites. As with the native sites, both sodium and chloride had maximum deposition rates in January and December. No abnormal meteorological trends were evident in January or December that would account for these increases. Additionally, as shown in Figure 4-1, neither the combined nominal drift rate or power levels were at maxima for the year in these months. However, the January maxima may have been the result of damaged drift eliminators on the cooling towers from a severe storm in 1986. Those eliminators were repaired in February 1987. Calcium, magnesium, and TSS had deposition peaks in July, while potassium deposition was highest in September. Phosphate, nitrate, and ammonium varied from month to month, with no identifiable trends.

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). For sodium, the annual mean deposition for the supplemental sites was significantly higher than those for 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.

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 were not computed for this table because more than 25 percent of the analytes were below the detection limit. A comparison of these sites shows that, for both pairs, agricultural sites 25 and 43 had higher deposition rates of all ions and TSS than did sites 40 and 42. For the agricultural site pair, calcium, magnesium, nitrate, and TSS were somewhat higher at site 25, while sodium, potassium, phosphate, ammonium, and chloride were somewhat higher at site 43. For the native site pair, sodium, calcium, magnesium, and TSS were somewhat higher at site 40 than at site 42. The higher deposition rates at site 40 may have been due to the influence of activities at agricultural areas surrounding this site. Higher deposition rates of some ions at one of the agricultural sites (site 25) than at the other may have been due to the different crops and cultivation practices at these sites.

5.2.2.4 Ion Ratios

The analyses of cooling tower basin water provide concentrations of ions present in the drift escaping from the towers. The drift preserves 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 1987 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. However, except for sodium to nitrate, the supplemental sites had larger ratios than all other site groups. All agricultural and native site

samples, however, had much lower ratios than the cooling tower circulating water.

5.2.3 Conclusions

From analyses of the drift 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. For 1987, cooling tower operations resulted in detectable deposition levels both onsite and at one offsite location (site 19) about 2.3 miles west of the Unit 2 cooling towers.

2. Agricultural sites show significantly higher average deposition than native sites. This is evident for the mean of all sites, including the paired control sites. The sum of mean measured ion deposition rates totaled approximately 60 and 37 pounds per acre per year for the agricultural and native sites, respectively. Mean deposition rates of sodium and chloride, however, were significantly higher for the native sites than the agricultural sites only when the supplemental sites closest to the cooling towers (i.e., 80-83) were included in the mean values.

3. A characteristic of all sites is the large variability in monthly measurements of most ions and TSS. Maxima are generally evident in January, July, and December, with minima in March and April. The exact pattern varies with the ion.

4. The drift deposition rates of most ions at two agricultural sites southwest of PVNGS (sites 23 and 30) are significantly higher than at all other agricultural sites. The highest mean annual sodium deposition rate measured at the agricultural sites was approximately 12 pounds per acre per year at site 23. No other geographic trends are evident for agricultural sites.

5. The supplemental native sites have significantly higher mean drift deposition rates for sodium, chloride, and TSS than all other native sites. Site 81 showed a significantly higher deposition rate of

sodium than the other supplemental sites. In addition, site 14 (onsite) showed a significantly higher deposition rate of calcium than all other native sites. This was probably due to the fugitive emissions from the operation of the sludge landfill east-southeast of site 14.

6. The increased deposition rates and ion ratios observed at the supplemental sites indicate the presence of drift from PVNGS cooling tower operation. Section 9 presents a more detailed assessment of these data in comparison with predictions and with those rates 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 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, 1987b), "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 1987 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 using 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, fluoride, and nitrate varied little between sites; calcium showed more variability. Sodium, chloride, and sulfate, primary ions in the PVNGS cooling tower drift, showed peak mean concentrations at site 20 and little variability at the remaining five sites. 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. Although all ions showed a great deal of variability, there were no trends similar to those of the deposition measurements. Nearly all of the ions showed maxima in the growing season (May-September). The exceptions were nitrate and fluoride, which had little month-to-month variation. Generally, minima occurred in the winter months.

5.3.3 Comparison of Airborne Concentrations and Drift Deposition Data

Of the 10 ions for which analyses were performed on the lo-vol air filters, iron is the only element that was not measured in the drift deposition. However, only five ions (sodium, calcium, chloride, magnesium, and nitrate) were present in both deposition and airborne samples at concentrations greater than their respective detection limits. Four of the five predominant ions were compared for possible associations between airborne concentrations and deposition using correlation coefficients; chloride was not analyzed because of insufficient deposition and lo-vol data above detection limits. Table 5-9 presents the correlation coefficients between deposition and airborne concentrations for the four ions at the six locations. With the exception of sodium at site 20, 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 samples 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 agricultural sites, 1987

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	5.1
Potassium, total	0.1	1.8	11.6
Calcium, total	0.1	1.8	0.1
Magnesium, total	0.05	0.9	20.2
Chloride	0.3	5.4	53.0
Fluoride	0.5	9.0	100.0
Sulfate	5.0/1.0†	72.0	60.8
Nitrate (as N)	0.05	0.9	27.2
Phosphate (as P)	0.02	0.36	71.2
Carbonate	5.0	‡	100.0
Bicarbonate	5.0	90.0	24.9
Ammonium (as N)	0.2	3.6	83.1
TSS (at 105°C)	5.0	90.0	28.2
Copper, total	0.1	§	47.1

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.

†Reduced from 5 milligrams per liter to 1 milligram per liter beginning in October.

‡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, 1987 (means ± standard errors)

Constituent	Agricultural sites	Native sites	Ratio, agricultural to native sites
Sodium	7.3 ± 0.3	8.1 ± 0.4	0.9 ± 0.06
Potassium	7.0 ± 0.5	3.5 ± 0.1	2.0 ± 0.15
Calcium	27.4 ± 1.6	13.4 ± 0.6	2.0 ± 0.15
Magnesium	5.9 ± 0.6	1.9 ± 0.1	3.1 ± 0.35
Nitrate (as N)	1.7 ± 0.1	1.4 ± 0.04	1.2 ± 0.08
Phosphate (as P)	0.9 ± 0.2	0.3 ± 0.02	3.0 ± 0.70
Ammonium (as N)	3.6 ± 0.4	2.1 ± 0.05	1.7 ± 0.19
Chloride	5.9 ± 0.3	6.6 ± 0.4	0.9 ± 0.07
TSS	494.7 ± 42.9	141.0 ± 3.8	3.5 ± 0.32

Key: TSS, total suspended solids.

Table 5-3. Deposition (lb/(acre)(yr)) of sodium, potassium, and calcium at PVNGS agricultural sites, 1987 (means ± standard errors)

Site	Sodium	Potassium	Calcium
7	5.0 ± 0.7[a]	3.2 ± 0.7[a]	17.3 ± 2.3[ab]
11	7.0 ± 0.8[abc]	5.5 ± 0.9[abc]	21.4 ± 2.0[abc]
12	6.5 ± 1.0[abc]	8.8 ± 2.3[cd]	27.9 ± 7.2[bc]
13	5.4 ± 0.7[a]	4.1 ± 0.8[a]	16.3 ± 1.7[ab]
23	11.7 ± 1.5[e]	19.0 ± 3.4[f]	83.9 ± 9.2[e]
24	4.9 ± 0.7[a]	6.6 ± 1.4[abcd]	16.4 ± 3.0[ab]
25	5.7 ± 0.5[ab]	8.2 ± 1.0[bcd]	30.6 ± 3.9[c]
28	5.5 ± 0.7[a]	3.0 ± 0.5[a]	22.4 ± 3.6[abc]
30	11.0 ± 1.2[e]	13.9 ± 1.7[e]	53.3 ± 5.7[d]
31	8.2 ± 0.9[bcd]	4.5 ± 0.9[ab]	28.1 ± 5.8[bc]
32	6.0 ± 0.7[ab]	4.6 ± 0.7[ab]	19.4 ± 3.5[abc]
43	8.9 ± 1.5[cde]	9.8 ± 2.8[de]	14.8 ± 1.2[a]
45	9.6 ± 1.1[de]	3.6 ± 0.6[a]	16.7 ± 2.5[ab]

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, 1987 (means ± standard errors)

Site	Sodium	Potassium	Calcium
1	7.7 ± 0.8^{abc}	2.7 ± 0.3^{ab}	16.0 ± 2.2^{bcdef}
2	7.5 ± 1.0^{abc}	3.2 ± 0.5^{abc}	12.8 ± 1.2^{abcde}
3	7.8 ± 1.3^{abc}	3.2 ± 0.4^{abc}	11.7 ± 1.1^{abcde}
4	6.1 ± 0.8^{a}	2.6 ± 0.4^{ab}	12.9 ± 0.9^{abcde}
5	5.7 ± 0.8^{a}	2.6 ± 0.4^{a}	11.4 ± 0.9^{abcde}
6	6.6 ± 0.6^{ab}	3.5 ± 0.5^{abc}	17.2 ± 2.5^{ef}
8	5.2 ± 0.5^{a}	2.7 ± 0.5^{ab}	10.2 ± 0.9^{abcde}
9	6.2 ± 0.8^{ab}	3.3 ± 0.5^{abc}	13.8 ± 1.6^{abcde}
10	6.6 ± 0.9^{ab}	3.2 ± 0.4^{abc}	14.2 ± 1.1^{abcde}
14	8.0 ± 1.1^{abc}	2.8 ± 0.4^{ab}	64.0 ± 15.0^{g}
15	4.8 ± 0.8^{a}	2.6 ± 0.4^{ab}	11.3 ± 1.1^{abcde}
16	12.1 ± 2.3^{bcd}	3.4 ± 0.5^{abc}	15.4 ± 2.1^{bcdef}
17	5.8 ± 0.7^{a}	4.0 ± 1.0^{abc}	10.3 ± 0.8^{abcde}
18	5.8 ± 0.7^{a}	4.0 ± 1.2^{abc}	9.4 ± 0.8^{abcde}
19	8.2 ± 0.9^{abcd}	4.3 ± 0.6^{abc}	12.0 ± 1.3^{abcde}
20	22.1 ± 6.2^{e}	4.1 ± 0.6^{abc}	12.9 ± 0.9^{abcde}
21	5.6 ± 0.7^{a}	3.9 ± 0.6^{abc}	10.1 ± 0.7^{abcde}
22	4.9 ± 0.6^{a}	3.1 ± 0.5^{abc}	9.5 ± 0.6^{abcde}
26	5.1 ± 0.6^{a}	3.0 ± 0.5^{abc}	8.9 ± 0.7^{abcd}
27	5.1 ± 0.6^{a}	3.3 ± 0.5^{abc}	10.0 ± 0.5^{abcde}
33	4.5 ± 0.6^{a}	3.2 ± 0.7^{abc}	8.7 ± 0.5^{abc}
34	4.8 ± 0.7^{a}	3.7 ± 0.9^{abc}	10.7 ± 1.9^{abcde}
35	5.8 ± 0.8^{a}	4.4 ± 0.8^{bc}	9.2 ± 0.9^{abcd}
36	4.7 ± 0.6^{a}	2.8 ± 0.5^{ab}	7.4 ± 0.6^{a}
37	5.5 ± 0.9^{a}	3.0 ± 0.5^{abc}	7.4 ± 0.7^{a}
38	5.2 ± 0.6^{a}	3.5 ± 0.6^{abc}	8.7 ± 0.5^{abc}
39	4.1 ± 0.5^{a}	3.1 ± 0.6^{abc}	7.1 ± 0.4^{a}
40	5.2 ± 0.5^{a}	4.6 ± 0.5^{c}	13.6 ± 1.2^{abcde}
41	5.1 ± 0.6^{a}	3.9 ± 0.8^{abc}	12.4 ± 1.5^{abcde}
42	4.6 ± 0.8^{a}	4.3 ± 1.1^{abc}	8.1 ± 0.8^{ab}
44	4.6 ± 0.7^{a}	3.6 ± 0.8^{abc}	9.4 ± 1.2^{abcde}
80	14.1 ± 2.3^{d}	3.7 ± 0.6^{abc}	23.0 ± 2.9^{f}
81	31.8 ± 5.8^{f}	4.6 ± 0.8^{c}	16.1 ± 1.4^{cdef}
82	12.8 ± 3.0^{cd}	3.6 ± 0.6^{abc}	16.7 ± 1.4^{def}
83	24.4 ± 7.3^{e}	3.7 ± 0.8^{abc}	15.6 ± 0.8^{bcdef}

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

Table 5-5. Deposition (lb/(acre)(yr)) of drift constituents at PVNGS native sites, 1987 (means ± standard errors)

Constituent	All native sites (except 80-83)	All onsite sites* (except 80-83)	Sites 80-83
Sodium	6.5 ± 0.3[a]	8.7 ± 0.7[a]	20.8 ± 2.6[a]
Potassium	3.4 ± 0.1	3.1 ± 0.1[a]	3.9 ± 0.4[a]
Calcium	12.8 ± 0.6[ab]	18.1 ± 1.7[a]	17.8 ± 0.9[b]
Magnesium	1.8 ± 0.9[ab]	2.5 ± 0.2[b]	2.5 ± 0.2[a]
Nitrate (as N)	1.3 ± 0.03[a]	1.6 ± 0.1[a]	2.4 ± 0.2[a]
Phosphate (as P)†	0.3 ± 0.02	0.4 ± 0.1	0.3 ± 0.04
Ammonium (as N)†	2.1 ± 0.1	2.2 ± 0.1	2.3 ± 0.1
Chloride†	5.0 ± 0.3	7.5 ± 0.8	18.8 ± 2.6
TSS	136.9 ± 4.0[a]	142.8 ± 6.3[b]	173.0 ± 11.2[ab]

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

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

†Significantly different statistics were not generated because of high percentage of data below detection.

Table 5-6. Deposition (lb/(acre)(yr)) of drift constituents at PVNGS agricultural and native control sites, 1987 (means ± standard errors)

Constituent	Agricultural sites 25	Agricultural sites 43	Native sites 40	Native sites 42
Sodium	5.7 ± 0.5	8.9 ± 1.5	5.2 ± 0.5	4.6 ± 0.8
Potassium	8.2 ± 1.0	9.8 ± 2.8	4.6 ± 0.5	4.3 ± 1.1
Calcium	30.6 ± 3.9	14.8 ± 1.2	13.6 ± 1.2	8.1 ± 0.8
Magnesium	9.1 ± 1.7	3.0 ± 0.3	3.3 ± 0.3	1.3 ± 0.2
Nitrate (as N)	2.1 ± 0.2	1.5 ± 0.2	1.0 ± 0.2	1.3 ± 0.2
Phosphate (as P)	0.8 ± 0.2	3.2 ± 1.9	0.2 ± 0.02	0.3 ± 0.1
Ammonium (as N)	1.8 ± 0.2	11.1 ± 4.4	1.8 ± 0.1	2.5 ± 0.5
Chloride	4.4 ± 0.4	12.5 ± 2.9	3.3 ± 0.3	3.9 ± 0.6
TSS	759.2 ± 122.2	209.4 ± 26.4	335.5 ± 40.4	114.6 ± 20.2

Key: TSS, total suspended solids.

Table 5-7. Ratios of ionic constituents of drift deposition at PVNGS monitoring sites and in cooling tower basin water, 1987

Ratio	Drift deposition: All agricultural sites	All native sites*	Onsite sites†	Supplemental sites	Cooling tower basin water‡
Sodium/potassium	1.0	2.3	2.8	5.3	34.3
Sodium/calcium	0.3	0.6	0.5	1.2	14.7
Sodium/magnesium	1.2	4.3	3.5	8.3	131.5
Sodium/nitrate	4.3	5.8	5.4	8.7	26.1

*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 ($\mu g/m^3$) collected by low-volume air samplers at PVNGS monitoring sites, 1987 (means ± standard errors)

Ion	Site 8	Site 9	Site 10	Site 20	Site 21	Site 27
Sodium	0.62 ± 0.03	0.64 ± 0.04	0.65 ± 0.04	1.00 ± 0.08	0.63 ± 0.05	0.71 ± 0.04
Calcium	1.20 ± 0.14	1.96 ± 0.20	1.63 ± 0.22	1.42 ± 0.17	1.38 ± 0.21	1.78 ± 0.21
Magnesium	0.05 ± 0.01	0.08 ± 0.02	0.10 ± 0.02	0.06 ± 0.01	0.05 ± 0.01	0.07 ± 0.01
Nitrate (as N)	0.19 ± 0.02	0.26 ± 0.01	0.24 ± 0.01	0.27 ± 0.02	0.23 ± 0.01	0.30 ± 0.04
Sulfate	1.70 ± 0.13	1.70 ± 0.14	1.68 ± 0.14	2.10 ± 0.15	1.57 ± 0.12	1.88 ± 0.21
Fluoride	0.02 ± 0.004	0.02 ± 0.004	0.02 ± 0.004	0.02 ± 0.005	0.02 ± 0.004	0.02 ± 0.004
Chloride	0.39 ± 0.10	0.43 ± 0.12	0.44 ± 0.13	0.63 ± 0.11	0.40 ± 0.12	0.44 ± 0.10

Table 5-9. Correlation, R,* between deposition and airborne concentration of predominant ions at PVNGS low-volume air sampler monitoring sites, 1987

Site	Ion			
	Calcium	Nitrate (as N)	Magnesium	Sodium
8	0.47	0.15	0.29	0.01
9	0.01	0.40	0.20	0.18
10	0.37	0.19	0.03	0.32
20	0.08	0.11	0.38	0.72
21	0.25	0.58	0.09	0.06
27	0.41	0.22	0.34	0.45

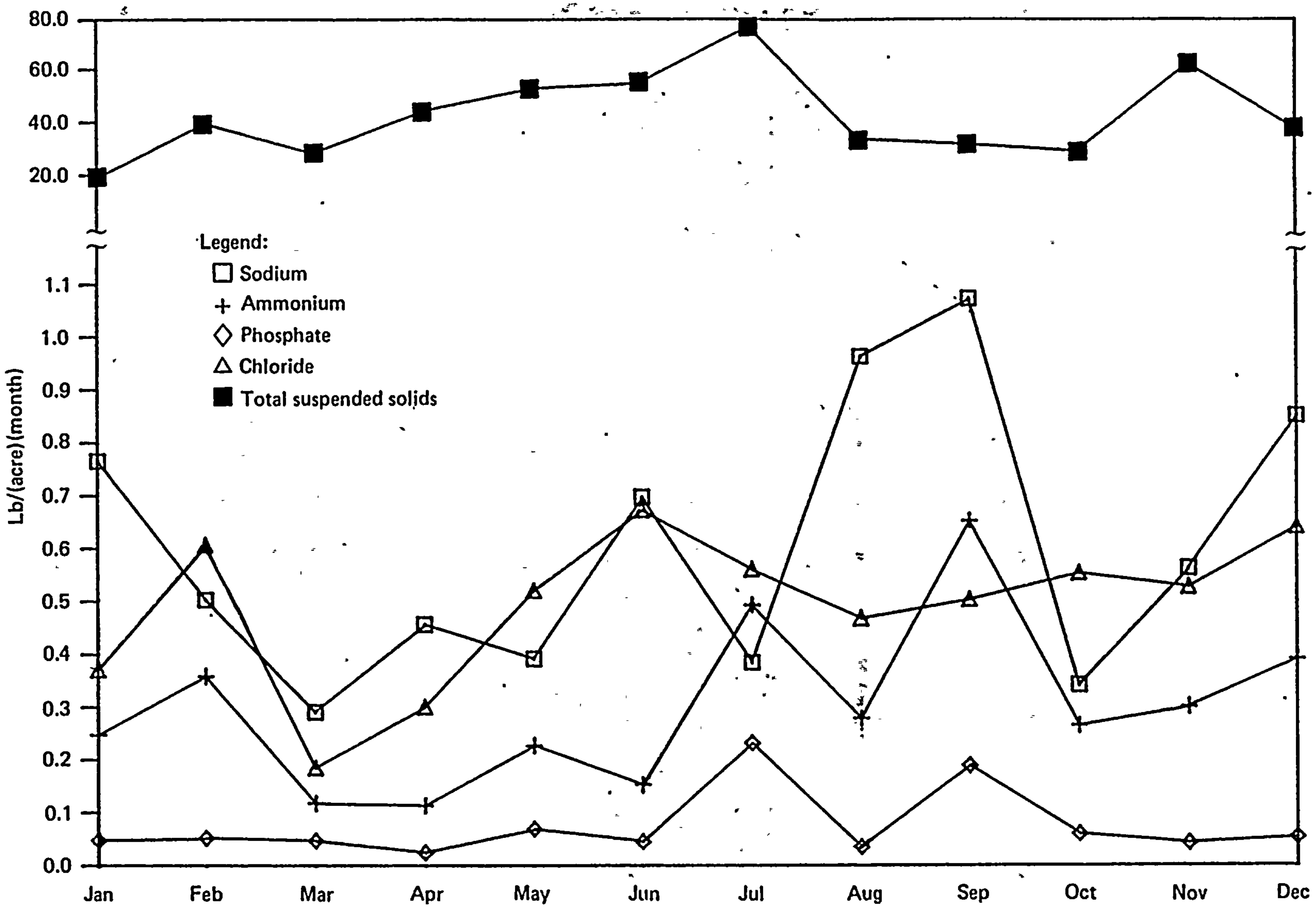


Figure 5-1. Mean monthly deposition of total suspended solids, sodium, ammonium, phosphate, and chloride at PVNGS agricultural monitoring sites, 1987

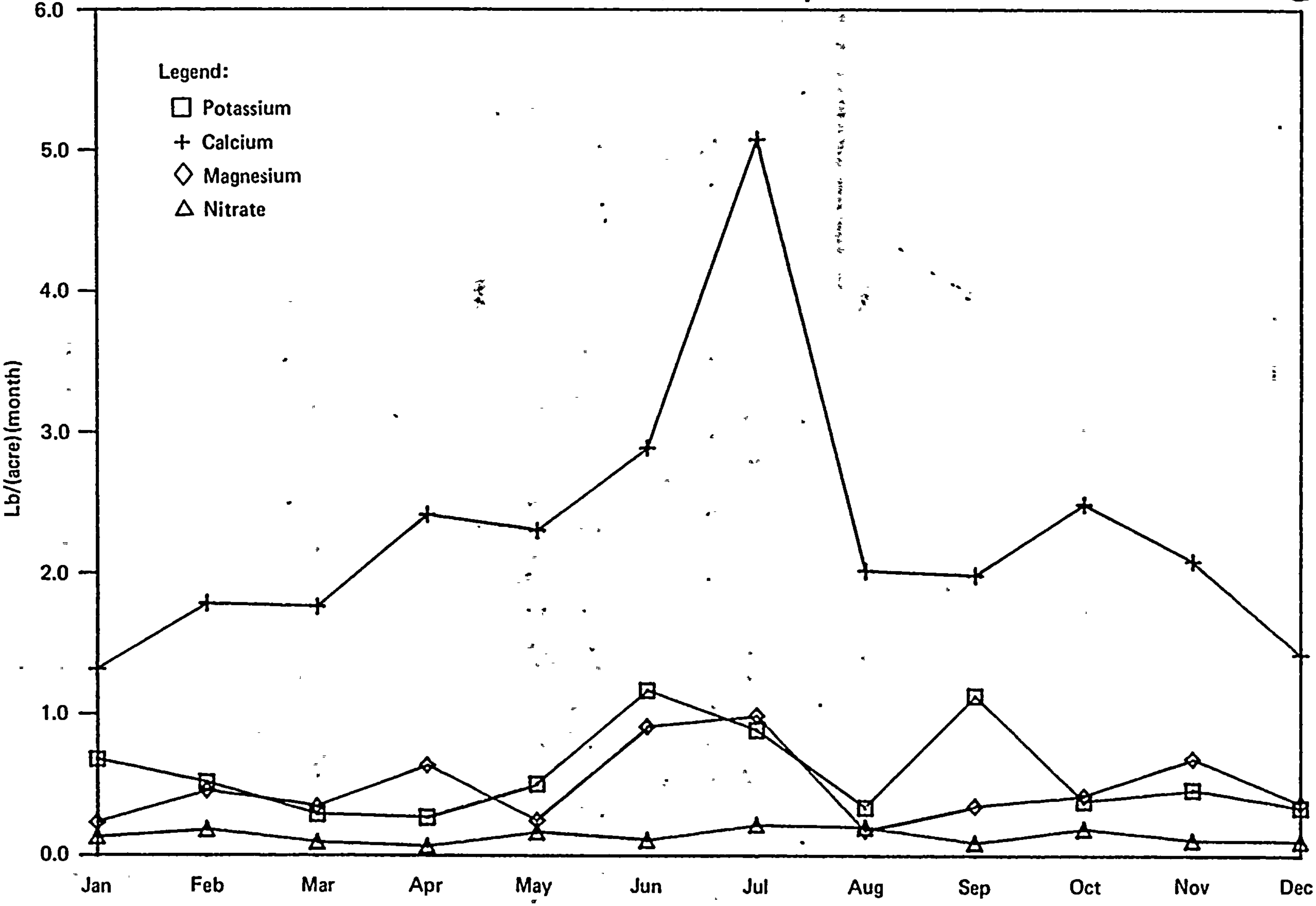


Figure 5-2. Mean monthly deposition of potassium, calcium, magnesium, and nitrate at PVNGS agricultural monitoring sites, 1987.

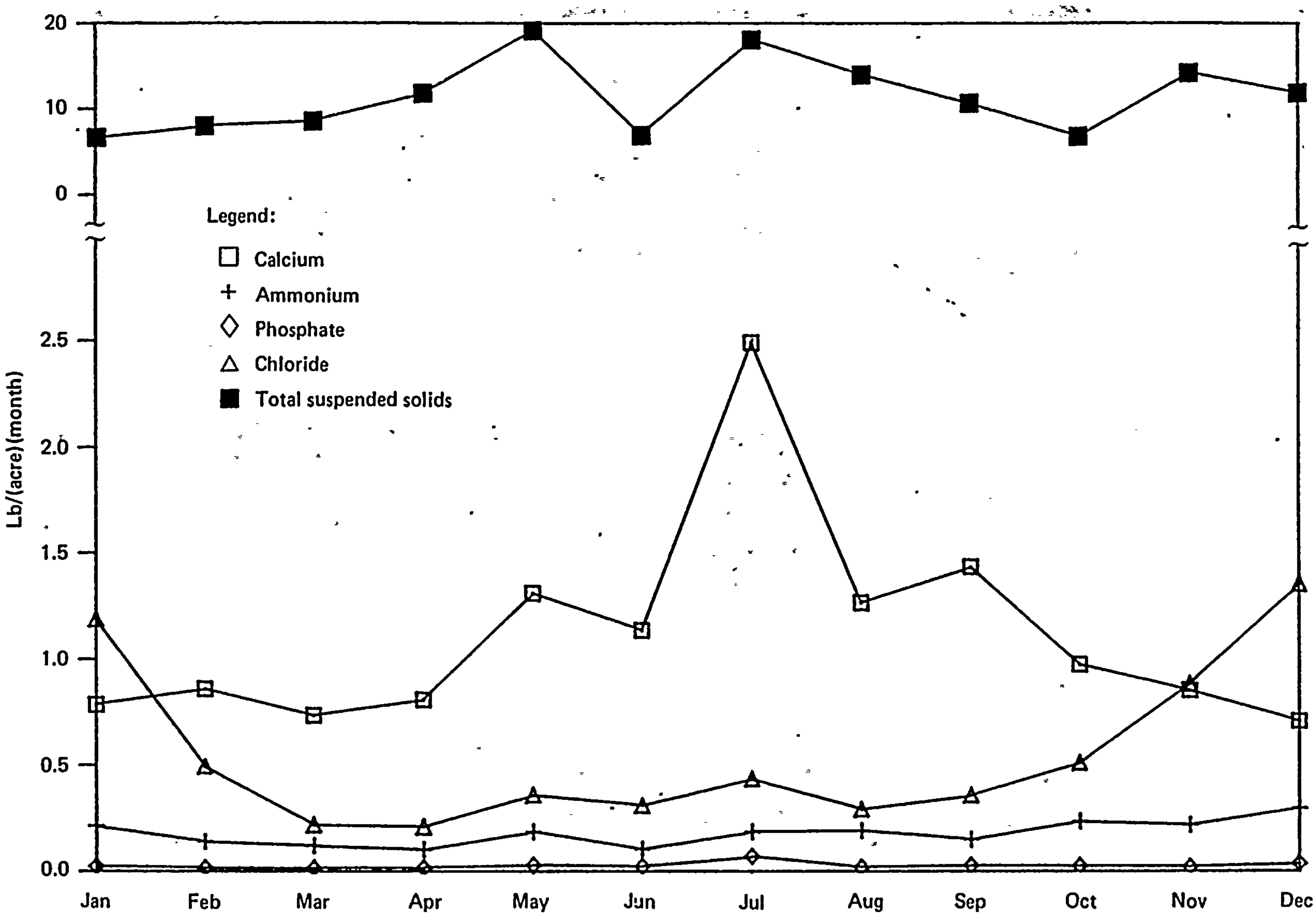


Figure 5-3. Mean monthly deposition of total suspended solids, calcium, ammonium, phosphate, and chloride at PVNGS native monitoring sites, 1987

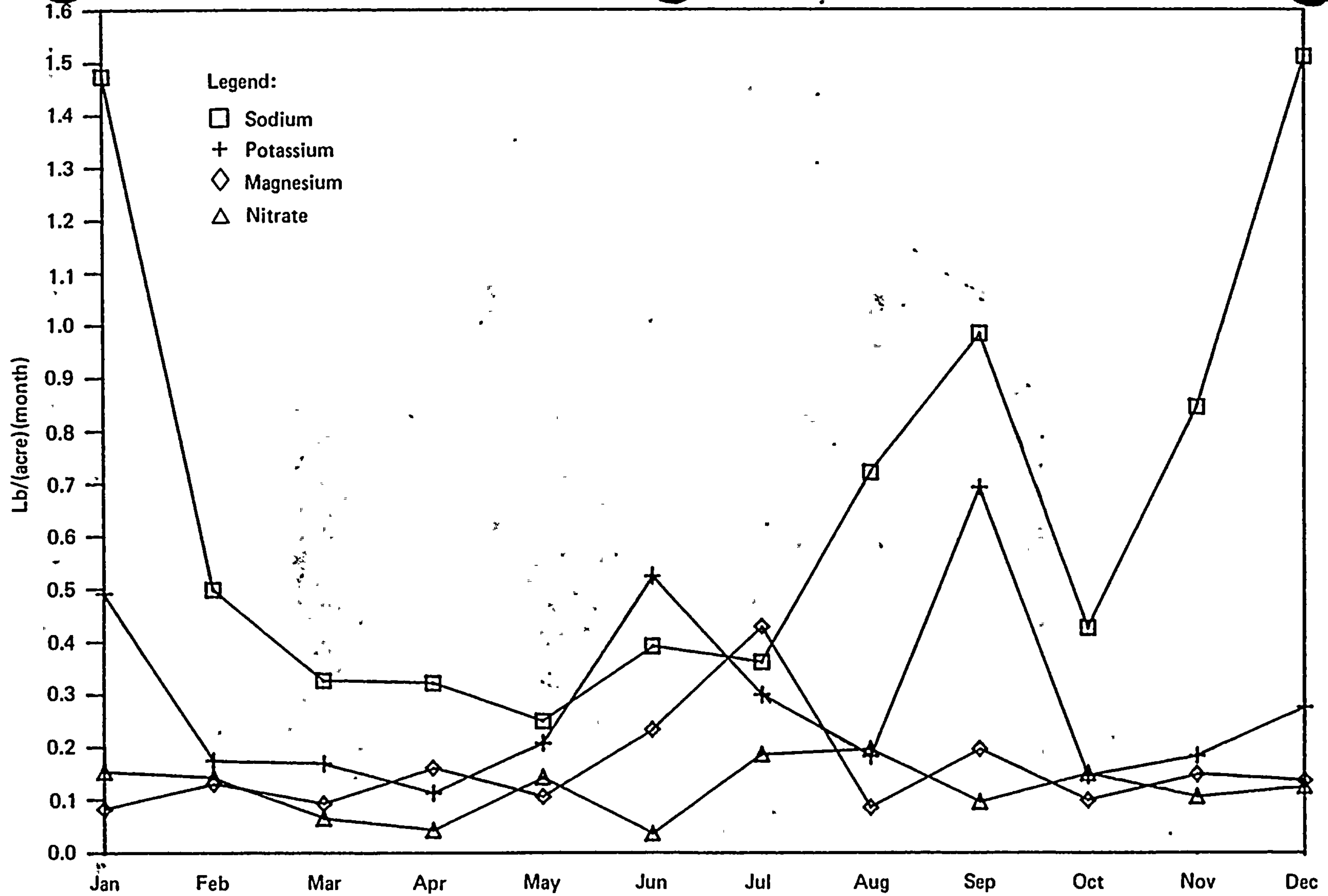


Figure 5-4. Mean monthly deposition of sodium, potassium, magnesium, and nitrate at PVNGS native monitoring sites, 1987

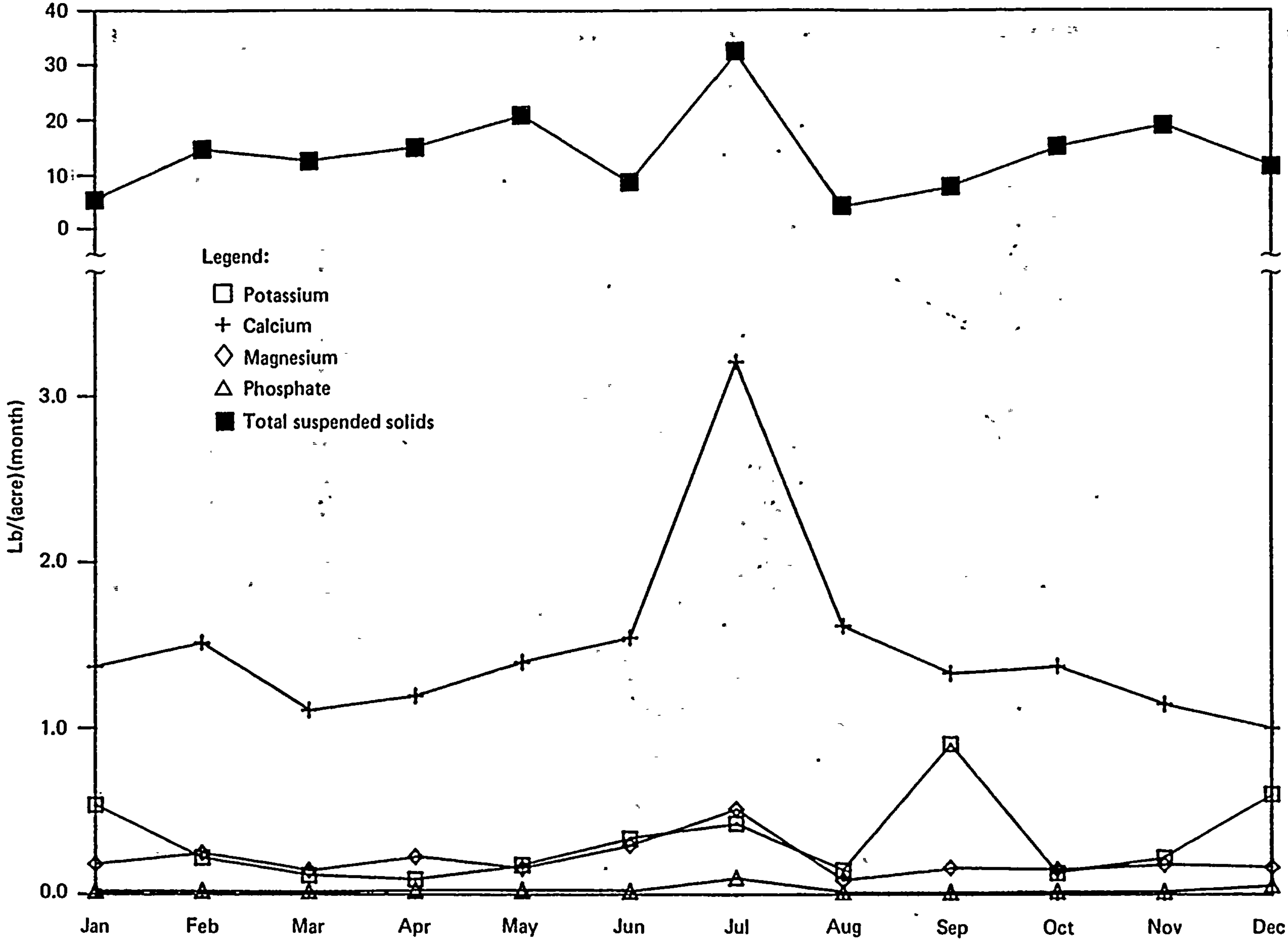


Figure 5-5. Mean monthly deposition of total suspended solids, potassium, calcium, magnesium, and phosphate at PVNGS supplemental monitoring sites, 1987

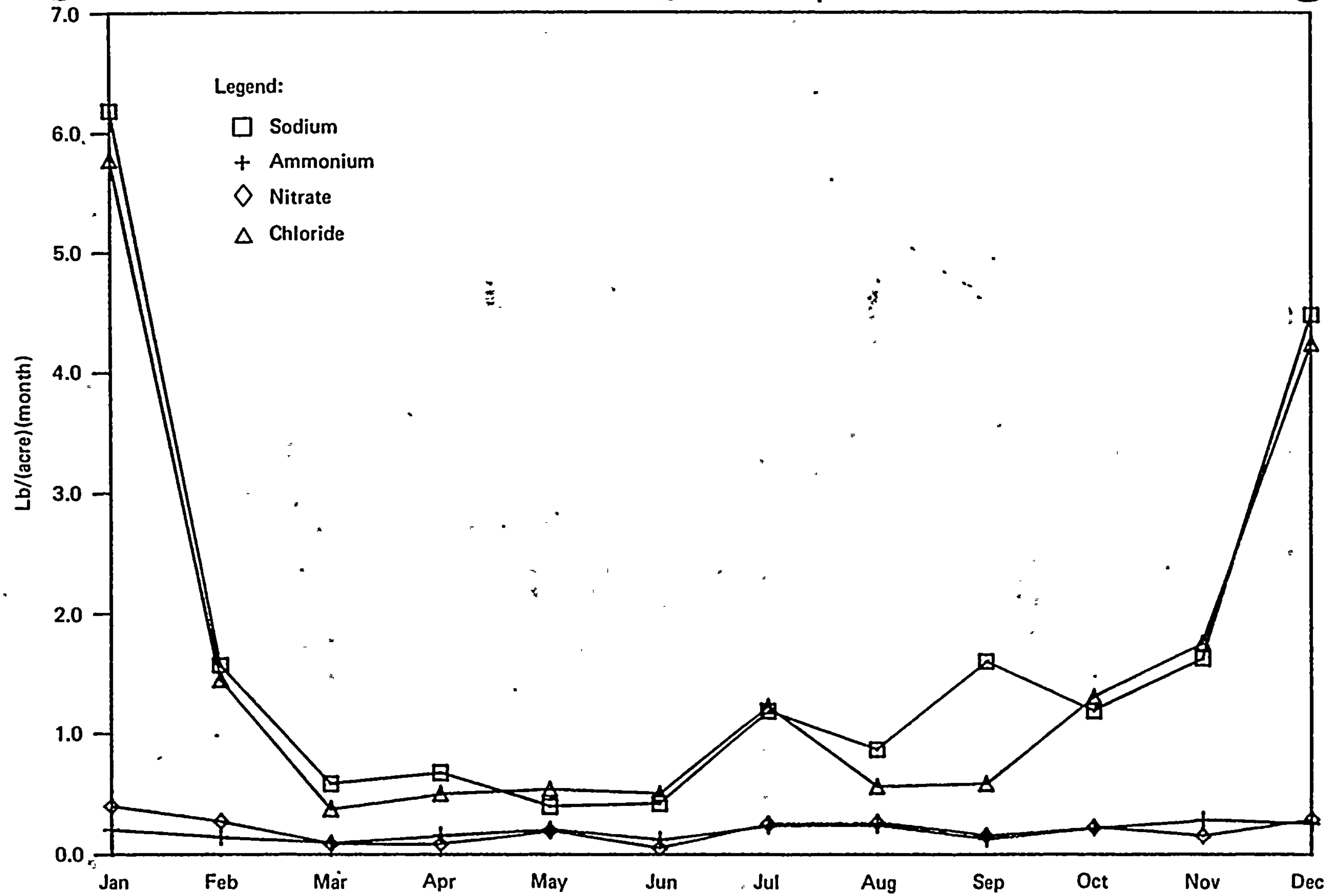


Figure 5-6. Mean monthly deposition of sodium, ammonium, nitrate, and chloride at PVNGS supplemental monitoring sites, 1987

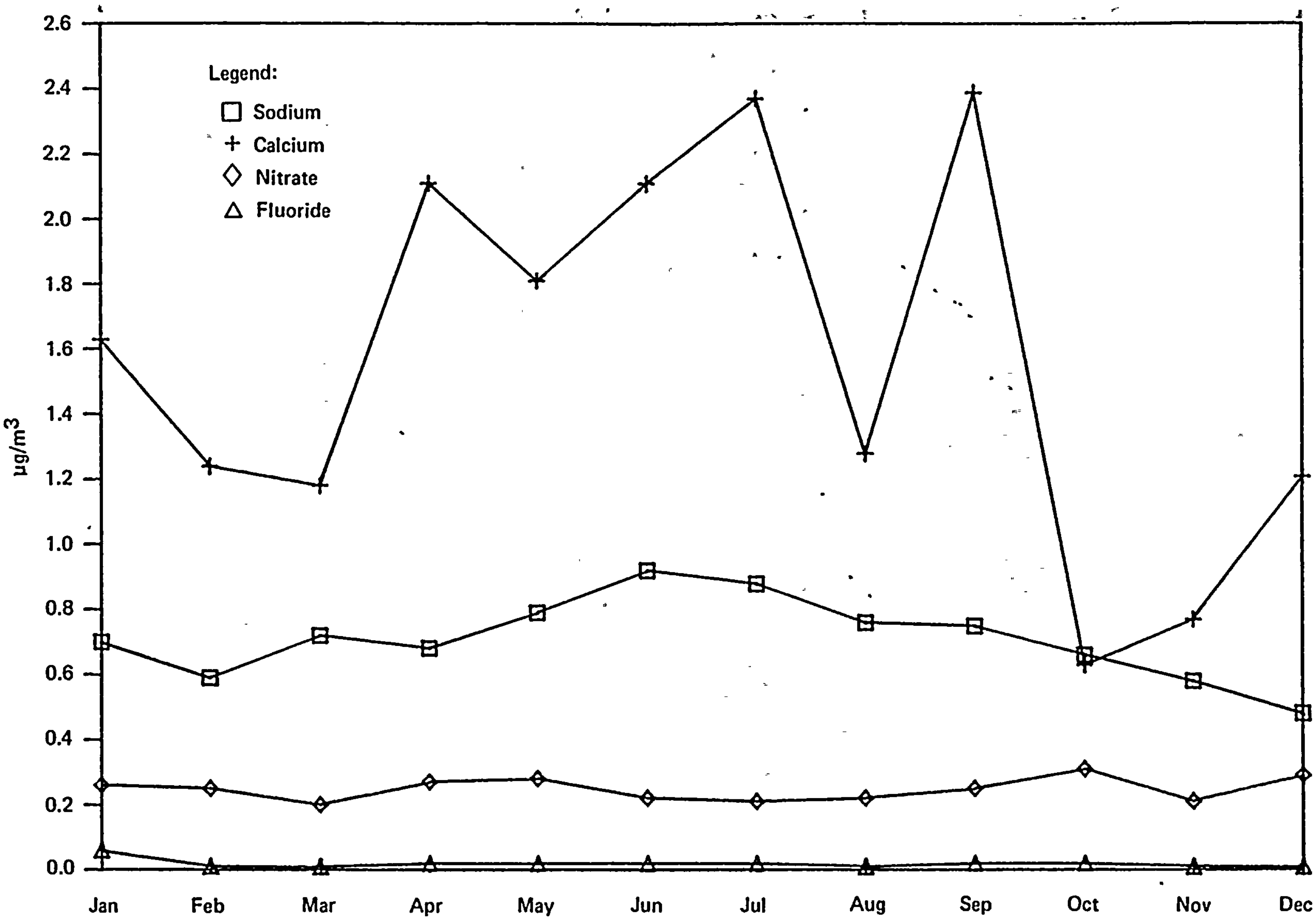


Figure 5-7. Mean monthly concentrations of sodium, calcium, nitrate, and fluoride in airborne particulate matter at PVNGS low-vo[illegible]e air sampler sites, 1987

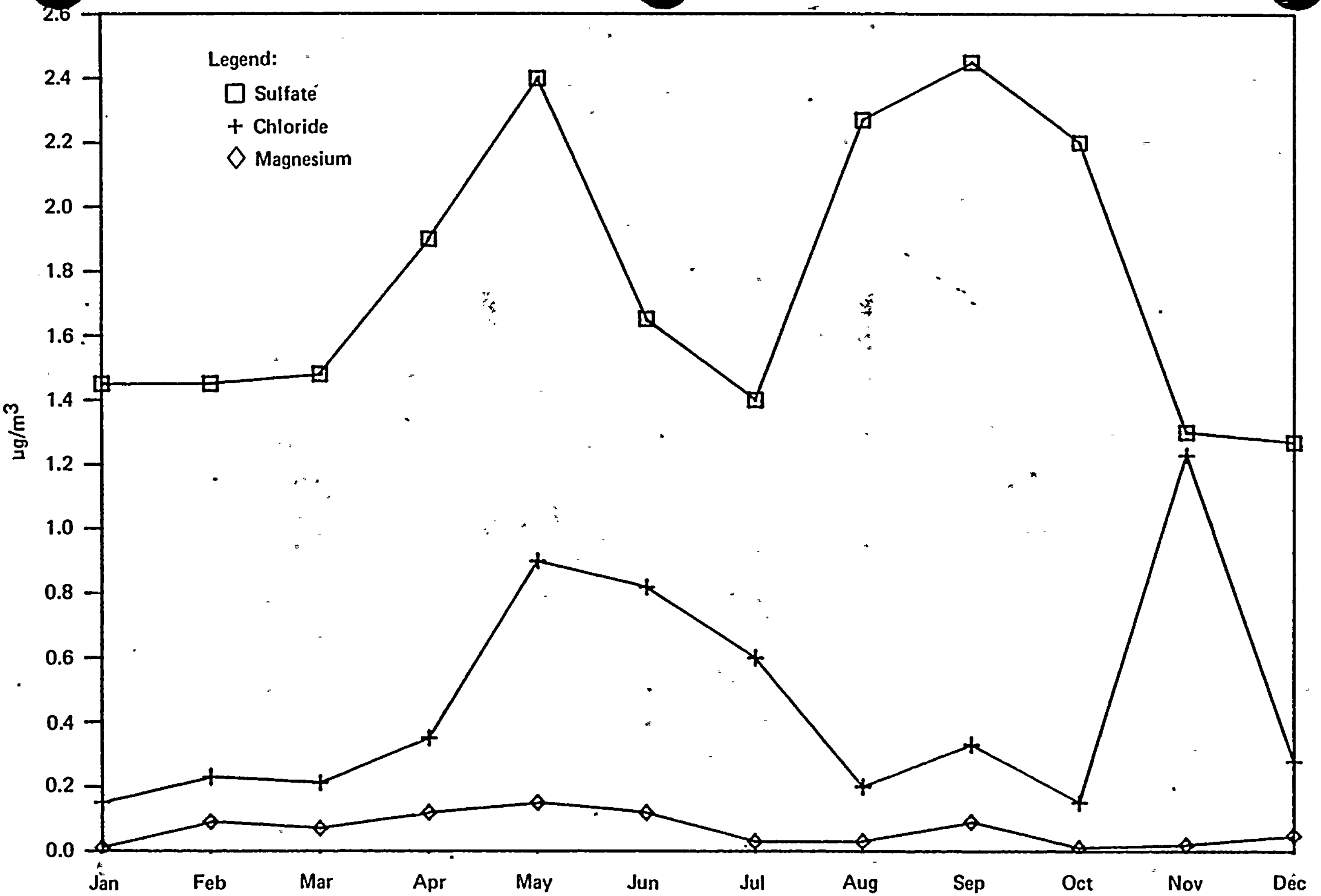


Figure 5-8. Mean monthly concentrations of sulfate, chloride, and magnesium in airborne particulate matter at PVNGS low-volume air sampler sites, 1987

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, 1972). The approach used here for evaluating the influence of cooling tower drift deposition on surrounding agricultural crops and indigenous flora was 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 1987: agricultural phytomass was taken during the middle (June/July) and end (September/October) of the growing season, and native phytomass was sampled during March and October. Because significant increases in concentrations of sodium and chloride were detected at monitoring sites 11 and 13 in 1986, these locations were sampled three times in 1987. Ten representative leaves or a minimum of 20 grams wet weight were collected from 10 randomly selected plots each season. Split samples were taken at one of the 10 plots 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 as micrograms per gram dry weight (parts per million).

The results of chemical analyses of leaf phytomass sampled during 1987 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, season, 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 1987 concentrations with preoperational (1983-1985) concentrations is given in Chapter 9.

6.1.1 Agricultural Crops

6.1.1.1 Alfalfa

Three agricultural monitoring sites containing alfalfa were sampled in 1987. Monitoring sites 23 and 30 lie about 1.5 miles due west of PVNGS and site 43, a control, approximately 15 miles southeast of the station (Figure 2-2). The ionic concentrations of the analytes--all except calcium--varied markedly at the different monitoring sites in 1987 (Table 6-1). The mean concentrations of sodium, potassium, and sulfate were significantly higher at monitoring site 23 than at site 30. No significant difference between monitoring site 30 and the control were found for concentrations of sodium, potassium, calcium, and sulfate. The mean concentrations of chloride, nitrate, phosphate, and fluoride were significantly different at each monitoring site. The control site had significantly higher levels of magnesium, chloride, and nitrate. Potassium was the most prevalent of the selected ions in alfalfa leaf tissue, followed by calcium and chloride. Nitrate and fluoride were the least prevalent.

6.1.1.2 Cotton

Five agricultural monitoring sites containing cotton were sampled during the 1987 growing season (Table 6-2). Monitoring sites 31 and 32 are close to each other, as are sites 11 and 13 (Figure 2-2); site 25, which serves as a control, is approximately 22 miles northwest of PVNGS. In 1987, most agricultural monitoring sites were planted in short-staple (upland) cotton; only site 25 (control) was planted in long-staple (Pima) cotton. With the exception of phosphate, the mean concentrations of ions measured in cotton leaf phytomass varied markedly between monitoring sites in 1987. The mean concentration of sodium was significantly higher at monitoring site 32 and significantly lower at site 25 than at the other sites; only sites 11 and 13 showed no real differences in sodium concentration. Sites 11 and 13 had similar

levels of potassium, as did sites 31 and 32. The mean concentration of potassium was significantly higher at site 25.

The mean concentrations of calcium at monitoring sites 31 and 32 were similar, and they were significantly lower than those recorded at sites 11, 13, and 25. Levels of magnesium ranged from 4078 parts per million at monitoring site 25 to 7488 parts per million at site 31; while again the mean concentrations were similar at monitoring sites 31 and 32, there was significant variation in magnesium concentration between the other sites. The mean concentrations of chloride ranged from 17,227 to 19,363 parts per million in 1987; the concentration was significantly higher at monitoring site 13 than at the other sites, and there were no significant differences between mean concentrations at the other sites. Sulfate concentrations in 1987 ranged from 28,603 to 43,421 parts per million, but there was no discernible trend in such concentrations. The mean concentration of nitrate, however, was significantly higher at the control site; there was no significant difference in nitrate levels at the other sites. Fluoride levels were similar, ranging from 9 to 13.6 parts per million.

Although the ionic concentrations at the agricultural monitoring sites in 1987 varied, some trends were apparent. In 1987, monitoring site 25 (control) had the lowest mean concentration of sodium, magnesium, and sulfate and the highest concentration of potassium and nitrate. The threshold values noted at site 25 may be influenced by the structural and physiological differences between the two varieties of cotton, upland and Pima. It should be noted, however, that at several other locations the two varieties exhibited no significant differences in concentrations of calcium, chloride, phosphate, and fluoride. Fairly consistent similarities in ionic concentration were observed for sites 31 and 32 and also for sites 11 and 13. For example, sites 11 and 13 differed significantly only in magnesium and chloride levels, and sites 31 and 32 were significantly different only in the mean concentrations of sodium and fluoride. Calcium and sulfate ions were the most prevalent of the measured ions in cotton leaf tissue in 1987; as with alfalfa, nitrate and fluoride were the least abundant.

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 1987. Sites 1, 4, and 6 are on the PVNGS site; sites 40 and 42, which serve as controls, are approximately 21 miles northwest and 15 miles southeast, respectively, of the station (Figure 2-2).

The mean concentration of sodium in creosote-bush leaf tissue ranged between 392 and 534 parts per million; site 42 had the lowest concentration, and there were no significant differences in concentration between the other sites (Table 6-3). There was no discernible trend for potassium; the mean concentration ranged from 9,108 to 13,212 parts per million and varied significantly between sites. Calcium concentrations ranged from 13,418 to 17,165 parts per million. No significant differences in the mean concentration of calcium were found between sites 1, 6, and 42 or between sites 4 and 40. The mean concentration of magnesium was not significantly different at any of the five monitoring sites in 1987.

The mean concentrations of chloride in creosote-bush leaf tissue in 1987 ranged from 6542 to 8214 parts per million and varied markedly between locations. The mean concentrations at sites 1, 4, and 6 were significantly higher than that at control site 40. At control site 42, however, the mean level of chloride was not significantly lower than those at sites 1 and 6. The mean level of sulfate was significantly lower at site 1 and significantly higher at site 4 than at the other onsite locations in 1987. There was no significant difference between sites 6, 40, and 42 in the mean concentration of sulfate in creosote-bush leaf tissue. Nitrate concentrations ranged from 31 to 51 parts per million and were highly variable between sites. Phosphate concentrations ranged from 967 to 1333 parts per million; mean phosphate levels at sites 1 and 4 were similar yet both differed significantly from those at locations 6, 40, and 42. The mean concentration of fluoride was significantly lower at control site 42; there was no significant difference, however, between control site 40 and sites 1, 4, and 6. Calcium and potassium were the most prevalent of the measured ions, and nitrate and fluoride were the least abundant.

6.1.2.2 Salt-Bush

The ionic content of salt-bush (Atriplex polycarpa) was measured at three monitoring sites in 1987. Monitoring sites 2 and 3 are on the PVNGS site, whereas site 44, which serves as a control, lies approximately 5 miles northwest (Figure 2-2).

The mean concentrations of sodium, calcium, and chloride in salt-bush leaf tissue in 1987 was significantly lower at control site 44 than at sites 2 and 3 (Table 6-4). Conversely, the mean concentrations of potassium and nitrate were significantly higher at the control site than at sites 2 and 3. There were no significant differences between sites for magnesium. Mean levels of sulfate and phosphate, however, were significantly different at each site in 1987. Sodium, chloride, potassium, and calcium were the most prevalent ions in salt-bush leaf tissue; nitrate and fluoride were the least prevalent.

6.2 COTTON YIELD

During the 1987 growing season, 5 of 13 agricultural monitoring sites were planted in cotton, three contained alfalfa, and five were fallow. Cotton was planted at agricultural sites 11, 13, 25, 31, and 32. Of the fields planted in cotton, all contained the upland (i.e., short-staple) variety except monitoring site 25, which was planted in Pima (i.e., long-staple) cotton.

The mean yield of upland cotton in 1987 ranged from 866 pounds per acre at monitoring site 31 to 3736 pounds per acre at site 11, and that of Pima cotton at location 25 was 1733 pounds per acre. The results of these estimates and a comparison of the 1987 harvest with those of 1983-1985 are discussed in greater detail in Section 9.4.

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 1987. Ten 1- by 10-meter plots were sampled during March and October. 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 follows Kearney and Peebles (1973).

6.3.1 Creosote-Bush

A comparison of the species composition, cover, and floristic diversity of five creosote-bush communities is presented in Table 6-5. Monitoring sites 1, 4, and 6 are on the PVNGS site; control sites 40 and 42 are approximately 25 and 20 miles, respectively, from PVNGS (Figure 2-2).

The dominant perennial species at each of the five sites in 1987 was creosote-bush. Relative cover values for creosote-bush at sites 1, 6, and 42 were nearly identical; percent cover was also similar at sites 4 and 40. As compared with herbs and grasses, which appeared almost exclusively during the March sampling, creosote-bush was the dominant species at each of the five sites during both sampling periods, and it characterized most of the native vegetation near PVNGS. Ragweed (Ambrosia dumosa) and plantain (Plantago insularis) were the dominant vascular herbaceous species in 1987. Foxtail brome (Bromus rubens) and Schismus sp., a short, sparse grass, were the dominant grasses present in 1987. Four species of cacti were found in 1987, and sites 4 and 42 supported the greatest abundance and diversity. One new species, hedgehog cactus (Echinocereus sp.), was identified in 1987 at site 4.

Species richness within the five plant communities in 1987 was lower than that observed in 1986; it ranged from 5 to 18. A cumulative total of 25 species were observed in 1987. Monitoring site 4 showed the greatest richness, and it was followed in order by sites 1, 42, 6, and 40. Plant communities at PVNGS, therefore, had species richness values that were similar to those of control site 42. Heterogeneity was generally lower in 1987 than in 1986 in each of the creosote-bush communities. Although site 40 ranked lowest in species richness, it exhibited the greatest heterogeneity. The heterogeneity of site 4, which showed the greatest species richness, could not be computed in 1987 because the flora were small and sparsely distributed.

6.3.2 Salt-Bush

Three salt-bush (Atriplex spp.) communities were measured in 1987. Salt-bush communities, which are fairly uncommon in the vicinity of PVNGS, were characterized by different species of flora than creosote-bush communities. Some species, however, were common to both communities.

Five species of perennial shrubs were identified from the three communities in 1987 (Table 6-6). Salt-bush (Atriplex polycarpa) was the dominant flora in each of the communities. A second species of salt-bush (Atriplex linearis) was also present but occurred much less frequently. The diversity of perennial shrubs at monitoring sites 2 and 3 was over twice that of the control site (site 44). As in the creosote-bush communities, plantain was the dominant herbaceous species and Schismus sp. was the dominant grass. No cacti were observed in the salt-bush communities.

In terms of species richness and heterogeneity, the control site ranked last in floristic diversity in 1987. Monitoring sites 2 and 3 had identical species richness, but the former exhibited greater heterogeneity. The salt-bush communities had a greater diversity of perennial shrubs than the creosote-bush communities, but the creosote-bush communities ranked higher in the floristic diversity of herbaceous species. A comparison of community structure in the preoperational and operational periods is presented in Section 9.4.2.

Table 6-1. Ion content (μg/g dry weight) of alfalfa leaf tissue at PVNGS agricultural monitoring sites, 1987 (means ± standard errors)

Ion	Monitoring site 23 (n = 20)	30 (n = 20)	43 (n = 10)
Sodium	3,267 ± 220[a]	1,711 ± 161[b]	2,053 ± 345[b]
Potassium	31,070 ± 374[a]	25,584 ± 744[b]	26,230 ± 672[b]
Calcium	12,617 ± 461[a]	12,375 ± 498[a]	13,817 ± 346[a]
Magnesium	2,491 ± 54[a]	1,871 ± 52[b]	2,704 ± 55[c]
Chloride	15,134 ± 367[a]	12,488 ± 309[b]	17,036 ± 506[c]
Sulfate	12,221 ± 463[a]	10,523 ± 292[b]	11,088 ± 806[d]
Nitrate (as N)	334 ± 32[a]	230 ± 30[b]	489 ± 52[c]
Phosphate (as P)	3,476 ± 32[a]	2,301 ± 68[b]	3,128 ± 67[c]
Fluoride	11.3 ± 0.3[a]	9.0 ± 0[b]*	10.1 ± 0.6[c]

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

*Difference statistics may be biased because sample means were not based on a normal distribution.

Table 6-2. Ion content (μg/g dry weight) of cotton leaf tissue at PVNGS monitoring sites, 1987 (means ± standard errors)

	Monitoring site				
Ion	11 (n = 20)	13 (n = 20)	25 (n = 20)	31 (n = 20)	32 (n = 20)
Sodium	4,180 ± 345[a]	5,637 ± 475[a]	556 ± 24[b]	8,178 ± 876[c]	14,408 ± 960[d]
Potassium	16,534 ± 739[ab]	17,246 ± 796[b]	21,230 ± 831[c]	13,623 ± 626[d]	13,341 ± 504[d]
Calcium	42,004 ± 2,467[a]	43,413 ± 1,268[a]	43,863 ± 2,610[a]	34,942 ± 1,897[b]	34,581 ± 1,159[b]
Magnesium	5,052 ± 191[a]	5,924 ± 127[b]	4,078 ± 196[c]	7,488 ± 472[d]	6,950 ± 182[d]
Chloride	17,227 ± 516[a]	19,363 ± 428[b]	17,836 ± 656[a]	17,836 ± 620[a]	17,734 ± 393[a]
Sulfate	43,421 ± 1,697[b]	41,973 ± 1,549[bd]	28,603 ± 1,722[a]	37,842 ± 3,200[cd]	35,995 ± 1,789[c]
Nitrate (as N)	202 ± 22[a]	176 ± 14[a]	302 ± 62[b]	141 ± 18[a]	167 ± 29[a]
Phosphate (as P)	2,105 ± 127[a]	2,156 ± 122[a]	2,384 ± 69[a]	2,082 ± 95[a]	2,224 ± 53[a]
Fluoride	12.0 ± 0.5[a]	11.9 ± 0.5[a]	13.6 ± 0.4[b]	9.0 ± 0[c*]	12.6 ± 0.7[ab]

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

*Difference statistics may be biased because sample means were not based on a normal distribution.

Table 6-3. Ion content (μg/g dry weight) of creosote-bush (*Larrea divaricata*) leaf tissue at PVNGS monitoring sites, 1987 (means ± standard errors).

Ion	Monitoring site 1 (n = 20)	4 (n = 20)	6 (n = 20)	40 (n = 20)	42 (n = 20)
Sodium	502 ± 21^{a}	534 ± 23^{a}	487 ± 24^{a}	490 ± 3^{a}	392 ± 13^{b}
Potassium	9,108 ± 316^{a}	12,931 ± 503^{c}	10,014 ± 458^{ab}	13,212 ± 430^{c}	10,923 ± 608^{b}
Calcium	16,849 ± 622^{a}	13,418 ± 786^{b}	16,058 ± 586^{a}	13,863 ± 453^{b}	17,165 ± 526^{a}
Magnesium	1,521 ± 76^{a}	1,661 ± 59^{a}	1,619 ± 88^{a}	1,455 ± 83^{a}	1,408 ± 49^{a}
Chloride	7,698 ± 335^{ac}	8,214 ± 420^{a}	7,440 ± 218^{ac}	6,542 ± 243^{b}	7,180 ± 279^{bc}
Sulfate	2,525 ± 145^{a}	4,673 ± 363^{b}	3,644 ± 217^{c}	3,527 ± 289^{c}	4,262 ± 313^{bc}
Nitrate (as N)	36.4 ± 4.0^{ab}	46.2 ± 2.6^{bc}	31.2 ± 3.0^{a}	40.1 ± 2.9^{abc}	51.0 ± 7.5^{c}
Phosphate (as P)	988 ± 45^{a}	967 ± 38^{a}	1,186 ± 50^{b}	1,333 ± 20^{b}	1,311 ± 91^{b}
Fluoride	19.0 ± 0.5^{a}	16.4 ± 0.5^{b}	17.3 ± 0.5^{b}	17.8 ± 0.4^{ab}	14.2 ± 0.5^{c}

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

Table 6-4. Ion content (μg/g dry weight) of salt-bush (Atriplex polycarpa) leaf tissue at PVNGS monitoring sites, 1987 (means $\pm$ standard errors)

Ion	Monitoring site 2 (n = 20)	3 (n = 20)	44 (n = 20)
Sodium	60,830 $\pm$ 3,599[a]	64,007 $\pm$ 3,738[a]	45,471 $\pm$ 2,459[b]
Potassium	19,179 $\pm$ 1,220[a]	20,224 $\pm$ 1,559[a]	24,332 $\pm$ 1,302[b]
Calcium	13,990 $\pm$ 824[a]	14,632 $\pm$ 823[a]	9,257 $\pm$ 492[b]
Magnesium	5,943 $\pm$ 481[a]	7,510 $\pm$ 429[a]	6,957 $\pm$ 451[a]
Chloride	54,376 $\pm$ 2,288[a]	56,308 $\pm$ 3,337[a]	45,522 $\pm$ 2,391[b]
Sulfate	6,393 $\pm$ 335[a]	5,044 $\pm$ 312[b]	8,517 $\pm$ 604[c]
Nitrate (as N)	114 $\pm$ 11[a]	129 $\pm$ 14[a]	246 $\pm$ 35[b]
Phosphate (as P)	1,215 $\pm$ 60[a]	1,000 $\pm$ 39[b]	1,522 $\pm$ 54[c]
Fluoride	9.0 $\pm$ 0[a]*	10.2 $\pm$ 0.3[b]	9.0 $\pm$ 0[a]*

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

*Difference statistics may be biased because sample means were not based on a normal distribution.

Table 6-5. Species composition, cover, and diversity of the flora in five creosote-bush (Larrea divaricata) communities at PVNGS monitoring sites, 1987 (sheet 1 of 2)

Parameter		Site 1	Site 4	Site 6	Site 40	Site 42	Cumulative total
		Species composition and percent cover					
SHRUBS							
Larrea divaricata	Creosote-bush	20.2	14.7	19.4	12.6	19.9	86.8
HERBS							
Ambrosia dumosa	Ragweed	1.4					1.4
Amsinckia intermedia	Fiddle-neck	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Bowlesia incana	None	<0.1					<0.1
Brassica Tournefortii	None		<0.1	<0.1			<0.1
Chaenactis Freemonti	None	<0.1	<0.1			<0.1	<0.1
Chorizanthe rigida	None	<0.1	<0.1	<0.1			<0.1
Cryptantha sp.	None					<0.1	<0.1
Daucus pusillus	Carrot	0.1					0.1
Eriogonum Thomasii	Wild-buckwheat		<0.1	<0.1		<0.1	<0.1
Erodium cicutarium	Heron-bill	<0.1		<0.1			<0.1
Erodium texanum	Heron-bill	<0.1	<0.1			<0.1	<0.1
Lepidium sp.	Pepper-grass	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Lesquerella Gordoni	Bladder-pod		<0.1				<0.1
Lotus salsuginosus	Deer-vetch		<0.1			<0.1	<0.1
Monoptilon bellioides	None	<0.1		<0.1			<0.1
Pectocarya platycarpa	None	<0.1	<0.1	<0.1		<0.1	<0.1
Plantago insularis	Plantain	<0.1	<0.1	0.2	<0.1	0.1	0.3

Table 6-5. Species composition, cover, and diversity of the flora in five creosote-bush (Larrea divaricata) communities at PVNGS monitoring sites, 1987 (sheet 2 of 2)

Parameter		Site 1	Site 4	Site 6	Site 40	Site 42	Cumulative total
Species composition and percent cover (continued)							
GRASSES							
Bromus rubens	Foxtail brome	0.7		0.8			1.5
Schismus sp.	None		<0.1				<0.1
Schismus arabicus	None		<0.1		3.0	0.2	3.2
CACTI							
Echinocereus sp.	Hedgehog cactus		<0.1				<0.1
Opuntia acanthocarpa	None		<0.1			<0.1	<0.1
Opuntia echinocarpa	None		<0.1			<0.1	<0.1
Opuntia ramossisima	None		0.3			<0.1	<0.1
Diversity and plot size							
Species richness		14	18	11	5	14	25
Heterogeneity (H')		.18	-	.09	.21	.06	U
Number of plots		20	20	20	20	20	100

Key: U, undetermined.

Table 6-6. Species composition, cover, and diversity of the flora in three salt-bush (*Atriplex* spp.) communities at PVNGS monitoring sites, 1987

Parameter		Site 2	Site 3	Site 44	Cumulative total
Species composition and percent cover					
SHRUBS					
Atriplex polycarpa	Salt-bush	24.2	23.9	7.6	55.7
Atriplex linearis	Salt-bush	0.1	0.1		0.2
Larrea divaricata	Creosote-bush	5.4		0.7	6.1
Lycium sp.	Wolf-berry	0.3	3.1		3.4
Prosopis velutina	Mesquite	6.3			6.3
HERBS					
Eriastrum diffusum	None		<0.1		<0.1
Erodium cicutarium	Heron-bill		<0.1		<0.1
Lepidium lasiocarpum	Pepper-grass	<0.1	<0.1		<0.1
Monoptilon bellioides	None	<0.1	<0.1		<0.1
Plantago insularis	Plantain	<0.1	<0.1	<0.1	<0.1
GRASSES					
Schismus arabicus	None			0.9	0.9
Schismus barbatus	None	<0.1	<0.1		<0.1
Diversity and plot size					
Species richness		9	9	4	12
Heterogeneity (H')		.39	.17	.24	U
Number of plots		20	20	20	60

Key: U, undetermined.

7 Remote Sensing/Aerial Photography

The PVNGS and vicinity were aerially photographed with color infrared (CIR) film on September 2, 1987. Specifications and associated data for the 1987 photomission are given in Table 7-1. Photographic coverage included the area within a 5-mile radius of the PVNGS cooling towers and the four control sites northwest and southeast of PVNGS (Figure 7-1). The infrared band of the electromagnetic spectrum exhibits a high level of reflectance from living vegetation such as agricultural crops and native flora. This reflectance can provide some indication of physiological and morphological changes in the vegetation; hence it is a useful tool for monitoring environmental change. It is particularly applicable in identifying vegetative stress.

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, or other factors that alter a plant's normal physiology. Stress conditions associated with salt deposition or uptake include chlorosis of the leaves, marginal necrosis, premature leaf drop, wilting, and widespread mortality. Significant vegetative stress from salt drift dispersion would appear on the CIR imagery as a homogeneous tonal signature covering an entire field or a large portion thereof.

Representative CIR imagery for sites 11 and 13 is included in Appendix H. From 1983 to 1987, site 11 was planted with upland cotton. Site 13 was planted with sorghum in 1983, but it contained upland cotton from 1984 to 1987. These two sites were selected for inclusion in this report because the mean concentrations of sodium and chloride have increased significantly since plant operations began in 1986.

The first CIR photograph (PVNGS-87 7-20) in Appendix H shows site 11. Although this field has been consistently planted in upland cotton since 1983, the field boundaries and total acreage planted have varied markedly. A comparison of the 1986 and 1987 imagery for site 11 shows nearly identical tonal signatures; these tonal signatures are also consistent with the 1983 imagery. Comparisons with the 1984 and 1985 imagery were not possible

because of spatial variations in planting. The second photograph (PVNGS-87 7-25) in Appendix H shows site 13. Vegetative growth patterns at this site have been fairly consistent for upland cotton since 1984. Ground truthing of sites 11 and 13 in 1987 confirmed the correlation of tonal signatures with spatial variability in growth. Both locations were infested with pink bollworm in 1987, and this was the most significant cause of vegetative stress observed. Symptoms associated with salt stress, such as chlorosis and necrosis of the leaves, were not observed.

Because of variability in soil fertility, moisture, plant genetics, and other factors, agricultural growth in a given field is rarely uniform and homogeneous. The reddish hues on the CIR imagery represent cotton plants that exhibited a more robust growth. Lighter hues represent areas of reduced growth. An examination of the 1987 CIR exposures yielded no evidence of significant, widespread vegetative stress in either agricultural crops or native plant communities. Patterns of agricultural vegetative growth in 1987 were consistent with those observed in preoperational years, suggesting that the observed variability was attributable not to PVNGS operations but rather to soil fertility, drainage, and agricultural practices.

Table 7-1. Summary of 1987 color infrared photomission at PVNGS and vicinity

Subcontractor	Aero/Science P. O. Box 4 Scottsdale, AZ 85252 (602) 948-6634
Date	September 2, 1987
Weather	Clear
Start time	10:07 a.m. Mountain Standard Time
Stop time	12:43 p.m. Mountain Standard Time
Altitude	3,000 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	F6.5
Scale	1:6000

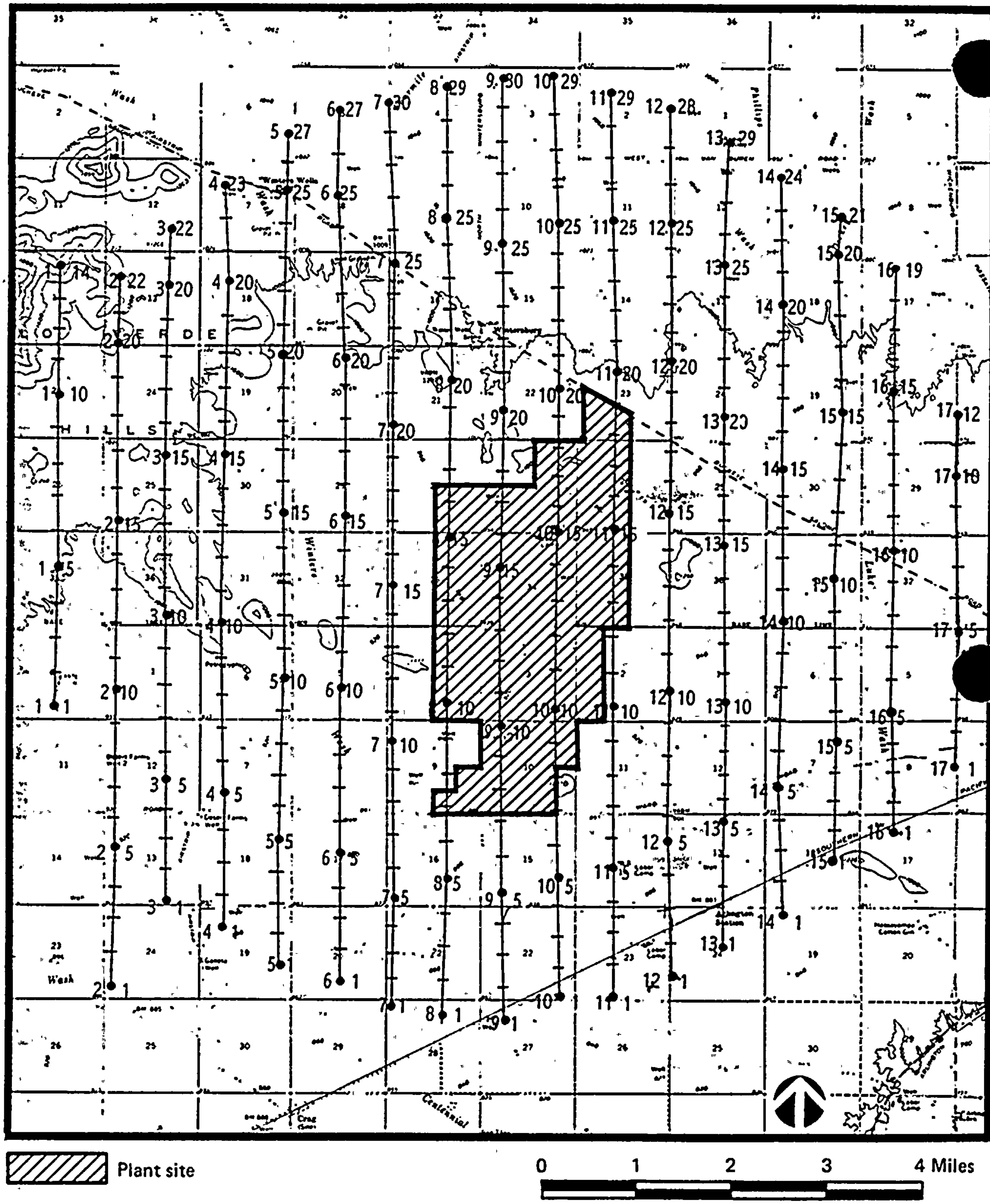


Figure 7-1. Orientation of flight lines of 1987 PVNGS color infrared aerial photomission

8.1 PHYSICAL ANALYSES

Soil samples collected from each site in 1983 were analyzed to determine their texture 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 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 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 Hassyampa River floodplain. The finest-textured soil is found at site 45.

8.2 CHEMICAL ANALYSES

8.2.1 Comparisons of Agricultural and Native Sites, 1987

Twelve soil samples were taken from each agricultural site in 1987: two replications (transects) for each of two depths for each of three seasons. Similarly, eight samples were taken from each native site: two replications for each of two depths for each of two seasons. 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.

Mean data for each measured parameter in the agricultural and the native samples are presented for each group in Table 8-1. The means were significantly different for 10 of the 19 measured parameters: electrical conductivity, pH, magnesium, sodium, fluoride, bicarbonate, ammonium, sulfate, exchangeable magnesium, and exchangeable sodium. In each case, the parameter values were greater in agricultural soils than in native soils. 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 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 bicarbonate and sulfate. The mean concentration of bicarbonate was greater in the upper-depth sample than in the lower-depth sample; the mean sulfate concentration was greater in the lower-depth sample than in the upper-depth sample.

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 only in the mean for exchangeable calcium; it was higher in July than in April and November. Bicarbonate was significantly higher in November than in April and July, and the mean for nitrate (as nitrogen) was significantly lower in November than in April and July. The mean soluble calcium concentration was significantly lower in November than in April and July.

The mean value for each parameter by site is presented in Table 8-4. Sites 7, 12, 24, 28, 32, and 45 were fallow in 1987, as they were in 1986. Sites 11, 13, 25, 30, and 31 were planted in cotton and sites 23 and 43 in alfalfa, as they were in 1986. A least-significant-difference (LSD) procedure was used to segregate the sites into homogeneous units based on the concentration of each parameter. These groupings are indicated by superscript in Table 8-4. For six parameters the LSD procedure identified site 30 as the only member of a group, indicating a statistically significant difference between site 30 and the other agricultural sites. Site 30 had the highest mean values for electrical conductivity, soluble sodium, chloride, and sulfate, exchangeable calcium, and exchangeable magnesium. These high concentrations may be attributable to the occasional accumulation of irrigation tailwater in that portion of the field where samples are taken. Five other sites are the only sites in a group for several parameters.

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 163 and 204 parts per million of sodium, respectively, in the dry 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 sample segment than in the lower 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 all parameters except soluble calcium, magnesium, and potassium, and exchangeable calcium, magnesium, and potassium. For most parameters exhibiting significant differences, mean parameter values were higher in the lower-depth samples; phosphate and ammonium were the only exceptions.

The distribution of soluble sodium by depth at each native site is shown in Figure 8-2. In contrast to the situation for agricultural sites, sodium concentrations were, in most cases, greater in the lower-depth samples in native soils; the only exceptions were the dry season samples from sites 4, 35, 40, and 42. Sites 35, 40, and 42 are remote sites, while site 4 is an onsite ecological monitoring plot.

Sites 3 and 16, both onsite locations, had much higher concentrations of sodium than the other sites. These sites are within 2000 feet of each other in the northwest section of the PVNGS site. The Soil Conservation Service (USDA, 1977) has shown that sites 3 and 16 are located in an area of naturally saline soils (Casa Grande-Laveen Complex), which suggests that the amount of sodium measured at these sites reflects natural conditions.

Sites 8, 21, 27, 36, 38, 39, 40, and 41 have moderate soluble sodium concentrations. There is no spatial trend to the distribution of these sites with respect to the PVNGS site. The soil at each of the sites has a sandy loam texture (see Appendix G), but the sites do not appear to have any other factor in common that would explain the moderate soluble sodium content.

Table 8-1. Chemical properties of agricultural and native soils at PVNGS monitoring sites, 1987 (means ± standard errors)

Parameter	Agricultural soils (n = 156)	Native soils (n = 248)
Electrical conductivity (mmhos/cm)	1.52 ± 0.09	1.07 ± 0.12
pH (units)	8.78 ± 0.03	8.68 ± 0.03
Soluble ions (ppm)		
Calcium*	51.7 ± 4.6	49.9 ± 3.5
Magnesium	7.1 ± 0.6	5.8 ± 0.3
Sodium	281 ± 15	176 ± 26
Potassium*	19.3 ± 1.5	23.3 ± 1.7
Chloride*	221 ± 20	186 ± 29
Boron*	2.3 ± 0.1	3.5 ± 0.6
Fluoride	6.7 ± 0.4	1.6 ± 0.2
Bicarbonate	223 ± 5	178 ± 5
Carbonate*	7.7 ± 0.7	9.7 ± 1.0
Nitrate (as N)*	28.7 ± 2.6	21.8 ± 2.8
Ammonium (as N)	2.8 ± 0.3	2.0 ± 0.2
Phosphate (as P)*	2.1 ± 0.1	2.2 ± 0.1
Sulfate	149 ± 12	49.2 ± 6.1
Exchangeable ions (meq/100g)		
Calcium*	26.2 ± 0.4	26.2 ± 0.4
Magnesium	2.2 ± 0.1	1.9 ± 0.1
Sodium	3.5 ± 0.1	2.1 ± 0.2
Potassium*	1.2 ± 0.1	1.3 ± 0.1

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

Table 8-2. Chemical properties of samples of soils collected at two depths at PVNGS agricultural and native monitoring sites, 1987 (means ± standard errors) (sheet 1 of 2)

Parameter	Depth*	Agricultural soils (n = 78)	Native soils (n = 124)
Electrical conductivity† (mmhos/cm)	U	1.43 ± 0.11	0.73 ± 0.08
	L	1.61 ± 0.14	1.41 ± 0.21
pH (units)†	U	8.78 ± 0.04	8.59 ± 0.03
	L	8.77 ± 0.04	8.77 ± 0.04
Soluble ions (ppm)			
Calcium†‡	U	53.4 ± 6.9	47.1 ± 2.5
	L	50.1 ± 6.0	52.7 ± 6.5
Magnesium†‡	U	7.2 ± 0.8	5.2 ± 0.3
	L	6.9 ± 0.9	6.3 ± 0.5
Sodium†	U	264 ± 19	102 ± 16
	L	297 ± 23	251 ± 48
Potassium†‡	U	20.2 ± 2.1	23.9 ± 2.4
	L	18.4 ± 2.1	22.7 ± 2.4
Chloride†	U	198 ± 26	106 ± 20
	L	244 ± 30	266 ± 54
Boron†	U	2.2 ± 0.1	1.8 ± 0.3
	L	2.4 ± 0.2	5.1 ± 1.2
Fluoride†	U	6.2 ± 0.4	0.9 ± 0.1
	L	7.1 ± 0.6	2.3 ± 0.4
Bicarbonate	U	235 ± 8	167 ± 5
	L	212 ± 6	189 ± 8
Carbonate†	U	8.4 ± 1.0	5.4 ± 0.6
	L	7.0 ± 0.8	13.9 ± 1.9
Nitrate (as N)†	U	32.1 ± 4.4	15.7 ± 1.9
	L	25.3 ± 2.7	27.9 ± 5.1
Ammonium (as N)†	U	3.4 ± 0.6	2.3 ± 0.3
	L	2.2 ± 0.2	1.7 ± 0.2
Phosphate (as P)†	U	2.2 ± 0.1	2.5 ± 0.2
	L	2.0 ± 0.1	1.9 ± 0.1
Sulfate	U	119 ± 12	29.6 ± 4.4
	L	178 ± 21	68.9 ± 11.2

Table 8-2. Chemical properties of samples of soils collected at two depths at PVNGS agricultural and native monitoring sites, 1987 (means ± standard errors) (sheet 2 of 2)

Parameter	Depth*	Agricultural soils (n = 78)	Native soils (n = 124)
Exchangeable ions (meq/100g)			
Calcium†‡	U	26.1 ± 0.6	26.3 ± 0.6
	L	26.4 ± 0.6	26.0 ± 0.6
Magnesium†‡	U	2.2 ± 0.1	1.9 ± 0.1
	L	2.2 ± 0.1	1.9 ± 0.1
Sodium†	U	3.3 ± 0.2	1.3 ± 0.2
	L	3.7 ± 0.2	3.0 ± 0.4
Potassium†‡	U	1.3 ± 0.1	1.3 ± 0.1
	L	1.2 ± 0.1	1.3 ± 0.1

*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 samples of soils collected at PVNGS agricultural monitoring sites, April, July, and November 1987 (means ± standard errors)

Parameter	April (end of wet season)	July (end of dry season)	November (postdefoliation)
Electrical conductivity (mmhos/cm)	1.65 ± 0.20[a]	1.63 ± 0.13[a]	1.29 ± 0.12[a]
pH (units)	8.73 ± 0.05[a]	8.82 ± 0.05[a]	8.77 ± 0.05[a]
Soluble ions (ppm)			
Calcium	62.6 ± 10.9[a]	55.1 ± 6.7[a]	37.5 ± 4.4
Magnesium	7.4 ± 1.3[a]	7.2 ± 1.0[a]	6.5 ± 0.7[a]
Sodium	270 ± 30[a]	309 ± 23[a]	262 ± 23[a]
Potassium	20.4 ± 2.5[a]	21.2 ± 2.7[a]	16.3 ± 2.5[a]
Chloride	257 ± 45[a]	239 ± 29[a]	167 ± 26[a]
Boron	2.5 ± 0.2[a]	2.5 ± 0.2[a]	2.0 ± 0.2[a]
Fluoride	6.5 ± 0.7[a]	6.4 ± 0.5[a]	7.1 ± 0.6[a]
Bicarbonate	213 ± 8[a]	207 ± 9[a]	251 ± 8
Carbonate	7.8 ± 1.3[a]	7.4 ± 1.0[a]	7.8 ± 1.1[a]
Nitrate (as N)	31.5 ± 5.1[a]	35.8 ± 5.2[a]	18.8 ± 2.2
Ammonium (as N)	2.9 ± 0.3[a]	3.1 ± 1.0[a]	2.4 ± 0.2[a]
Phosphate (as P)	1.9 ± 0.1[a]	2.2 ± 0.1[a]	2.3 ± 0.1[a]
Sulfate	150 ± 23[a]	147 ± 20[a]	150 ± 21[a]
Exchangeable ions (meq/100g)			
Calcium	25.5 ± 0.8[a]	28.9 ± 0.7	24.3 ± 0.5[a]
Magnesium	2.1 ± 0.1[a]	2.3 ± 0.1[a]	2.2 ± 0.1[a]
Sodium	3.4 ± 0.3[a]	3.8 ± 0.2[a]	3.3 ± 0.2[a]
Potassium	1.2 ± 0.1[a]	1.3 ± 0.1[a]	1.2 ± 0.1[a]

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

Note: Sample size was 52 for each season.

Table 8-4. Chemical properties of soils collected at PVNGS agricultural monitoring sites, 1987 (means ± standard errors) (sheet 1 of 2)

Parameter	Site 7 Fallow	Site 11 Cotton	Site 12 Fallow	Site 13 Cotton	Site 23 Alfalfa	Site 24 Fallow	Site 25 Cotton
Electrical conductivity (mmhos/cm)	0.8 ± 0.07^{ab}	1.74 ± 0.37^{cde}	2.29 ± 0.20^{e}	1.31 ± 0.30^{bcd}	0.76 ± 0.03^{ab}	1.26 ± 0.20^{bc}	1.23 ± 0.25^{bc}
pH	8.92 ± 0.05^{de}	8.40 ± 0.07^{a}	8.41 ± 0.06^{a}	8.65 ± 0.03^{b}	8.82 ± 0.03^{cd}	8.66 ± 0.06^{b}	8.33 ± 0.04^{a}
Soluble ions (ppm)							
Calcium	23.3 ± 1.9^{a}	82.6 ± 33.1^{bc}	83.7 ± 13.3^{bc}	51.1 ± 12.2^{ab}	36.0 ± 1.4^{a}	45.3 ± 8.6^{ab}	96.5 ± 19.7^{c}
Magnesium	4.2 ± 0.4^{a}	6.7 ± 2.5^{abc}	9.4 ± 1.5^{bc}	6.8 ± 1.4^{abc}	3.7 ± 0.3^{a}	6.0 ± 1.0^{abc}	14.7 ± 3.2^{d}
Sodium	167 ± 21^{ab}	311 ± 47^{cde}	347 ± 27^{def}	230 ± 49^{bc}	154 ± 8.3^{ab}	209 ± 25^{abc}	153 ± 33^{ab}
Potassium	9.2 ± 0.7^{ab}	25.6 ± 3.3^{def}	68.0 ± 4.9^{g}	19.2 ± 3.2^{cd}	7.9 ± 0.4^{ab}	29.5 ± 4.5^{f}	20.7 ± 2.6^{cde}
Chloride	64.0 ± 11.9^{a}	275 ± 87^{cd}	394 ± 56^{d}	228 ± 81^{bc}	61.9 ± 4.2^{a}	141 ± 35^{abc}	112 ± 28^{ab}
Fluoride	3.4 ± 0.2^{bc}	10.9 ± 1.1^{gh}	7.7 ± 0.4^{ef}	7.8 ± 1.1^{ef}	11.8 ± 0.4^{h}	4.4 ± 0.5^{cd}	1.2 ± 0.2^{a}
Bicarbonate	231 ± 14^{def}	205 ± 18^{bcde}	193 ± 15^{bcd}	187 ± 20^{bc}	290 ± 5.2^{h}	178 ± 16^{ab}	140 ± 10.3^{a}
Carbonate	6.2 ± 1.4^{abc}	2.6 ± 0.2^{a}	2.4 ± 0.0^{a}	3.2 ± 0.7^{ab}	9.2 ± 1.3^{c}	2.5 ± 0.2^{a}	2.4 ± 0.0^{a}
Nitrate (as N)	19.4 ± 2.2^{abcd}	41.7 ± 14.4^{defg}	55.6 ± 5.5^{g}	26.6 ± 9.9^{abcde}	6.7 ± 0.5^{a}	47.7 ± 11.0^{efg}	52.7 ± 17.9^{fg}
Ammonium (as N)	2.5 ± 0.2^{abc}	2.2 ± 0.5^{abc}	3.1 ± 0.5^{abc}	8.4 ± 3.8^{d}	3.3 ± 0.2^{abc}	1.8 ± 0.2^{abc}	0.8 ± 0.3^{ab}
Phosphate (as P)	3.4 ± 0.3^{g}	1.3 ± 0.1^{b}	3.0 ± 0.1^{fg}	2.2 ± 0.2^{de}	2.1 ± 0.1^{cd}	1.7 ± 0.1^{bc}	2.7 ± 0.2^{ef}
Sulfate	58.1 ± 9.7^{ab}	128 ± 21^{bc}	179 ± 12^{c}	67.3 ± 14.3^{ab}	23.3 ± 4.7^{a}	74.5 ± 12.7^{ab}	171 ± 29^{c}
Boron	2.0 ± 0.2^{b}	2.0 ± 0.1^{b}	3.2 ± 0.3^{c}	1.3 ± 0.1^{a}	1.5 ± 0.1^{ab}	1.3 ± 0.1^{a}	1.1 ± 0.1^{a}
Exchangeable ions (meq/100g)							
Calcium	22.8 ± 0.3^{ab}	29.5 ± 1.1^{g}	23.3 ± 0.3^{abc}	24.3 ± 0.6^{bcd}	27.2 ± 1.5^{efg}	24.1 ± 0.4^{bcd}	28.6 ± 1.0^{fg}
Magnesium	2.93 ± 0.08^{f}	1.78 ± 0.03^{bc}	1.77 ± 0.05^{b}	1.75 ± 0.04^{b}	2.20 ± 0.07^{e}	2.08 ± 0.04^{de}	2.77 ± 0.14^{f}
Sodium	2.0 ± 0.2^{ab}	3.7 ± 0.4^{e}	3.7 ± 0.2^{e}	2.4 ± 0.3^{abc}	3.4 ± 0.2^{de}	2.7 ± 0.2^{bcd}	1.8 ± 0.3^{a}
Potassium	0.56 ± 0.03^{b}	1.76 ± 0.04^{f}	2.61 ± 0.05^{h}	1.05 ± 0.03^{c}	1.28 ± 0.07^{de}	1.82 ± 0.10^{f}	1.40 ± 0.06^{e}

Table 8-4. Chemical properties of soils collected at PVNGS agricultural monitoring sites, 1987 (means ± standard errors) (sheet 2 of 2)

Parameter	Site 28 Fallow	Site 30 Cotton	Site 31 Cotton	Site 32 Fallow	Site 43 Alfalfa	Site 45 Fallow
Electrical conductivity (mmhos/cm)	0.53 ± 0.02^{a}	3.42 ± 0.56^{f}	1.29 ± 0.18^{bcd}	1.82 ± 0.17^{cde}	1.39 ± 0.11^{bcd}	1.98 ± 0.23^{de}
pH	9.02 ± 0.03^{e}	8.57 ± 0.08^{b}	9.22 ± 0.06^{f}	9.18 ± 0.04^{f}	8.68 ± 0.04^{bc}	9.23 ± 0.08^{f}
Soluble ions (ppm)						
Calcium	29.6 ± 3.1^{a}	109 ± 29^{c}	23.5 ± 1.5^{a}	23.3 ± 1.4^{a}	49.3 ± 2.7^{ab}	19.8 ± 1.4^{a}
Magnesium	4.5 ± 1.3^{ab}	15.3 ± 4.3^{d}	4.1 ± 0.9^{a}	2.9 ± 0.5^{a}	11.1 ± 0.7^{cd}	2.3 ± 0.2^{a}
Sodium	117 ± 6.0^{a}	604 ± 75^{g}	292 ± 36^{cde}	391 ± 41^{ef}	246 ± 24^{bcd}	428 ± 51^{f}
Potassium	8.9 ± 0.9^{ab}	27.2 ± 4.2^{ef}	7.5 ± 1.3^{a}	7.3 ± 0.9^{a}	15.3 ± 1.7^{bc}	4.7 ± 0.4^{a}
Chloride	29.7 ± 5.2^{a}	636 ± 131^{e}	174 ± 48^{abc}	272 ± 39^{bcd}	229 ± 26^{bc}	260 ± 46^{bcd}
Fluoride	1.9 ± 0.1^{ab}	6.1 ± 0.8^{de}	8.8 ± 0.6^{f}	9.3 ± 0.6^{fg}	0.9 ± 0.1^{a}	12.3 ± 1.0^{h}
Bicarbonate	226 ± 4.8^{cdef}	225 ± 20^{cdef}	240 ± 17^{ef}	254 ± 12^{fgh}	248 ± 14^{fg}	289 ± 14^{gh}
Carbonate	6.5 ± 0.9^{bc}	5.7 ± 1.3^{abc}	15.3 ± 3.2^{d}	14.2 ± 1.6^{d}	2.8 ± 0.3^{ab}	26.9 ± 2.3^{e}
Nitrate (as N)	11.6 ± 1.1^{ab}	39.1 ± 10.5^{cdefg}	17.0 ± 2.3^{abc}	31.1 ± 4.0^{bcdef}	7.5 ± 0.7^{a}	16.3 ± 2.0^{abc}
Ammonium (as N)	1.8 ± 0.2^{abc}	2.5 ± 0.5^{abc}	0.4 ± 0.2^{a}	1.4 ± 0.4^{abc}	3.7 ± 0.6^{bc}	4.2 ± 0.5^{c}
Phosphate (as P)	1.5 ± 0.2^{b}	1.4 ± 0.1^{b}	1.5 ± 0.2^{b}	2.2 ± 0.2^{d}	4.0 ± 0.2^{h}	0.6 ± 0.1^{a}
Sulfate	32.7 ± 7.3^{a}	451 ± 70^{e}	126 ± 30^{bc}	172 ± 30^{c}	181 ± 24^{c}	269 ± 57^{d}
Boron	1.7 ± 0.1^{ab}	4.6 ± 0.3^{d}	2.0 ± 0.1^{b}	3.1 ± 0.3^{c}	2.2 ± 0.1^{b}	4.4 ± 0.6^{d}
Exchangeable ions (meq/100g)						
Calcium	32.1 ± 0.6^{h}	35.6 ± 1.2^{i}	21.0 ± 0.7^{a}	20.9 ± 0.5^{a}	25.3 ± 1.0^{cde}	26.4 ± 1.0^{def}
Magnesium	1.80 ± 0.04^{bc}	3.78 ± 0.08^{h}	1.08 ± 0.04^{a}	1.16 ± 0.05^{a}	3.58 ± 0.09^{g}	1.96 ± 0.05^{cd}
Sodium	2.8 ± 0.1^{cd}	6.8 ± 0.5^{f}	2.8 ± 0.2^{cd}	4.0 ± 0.3^{e}	2.8 ± 0.1^{bcd}	6.5 ± 0.4^{f}
Potassium	1.21 ± 0.05^{d}	2.00 ± 0.07^{g}	0.36 ± 0.04^{a}	0.40 ± 0.02^{a}	0.94 ± 0.06^{c}	0.65 ± 0.03^{b}

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 h successively higher levels.

Note: Sample size was 12 for all sites.

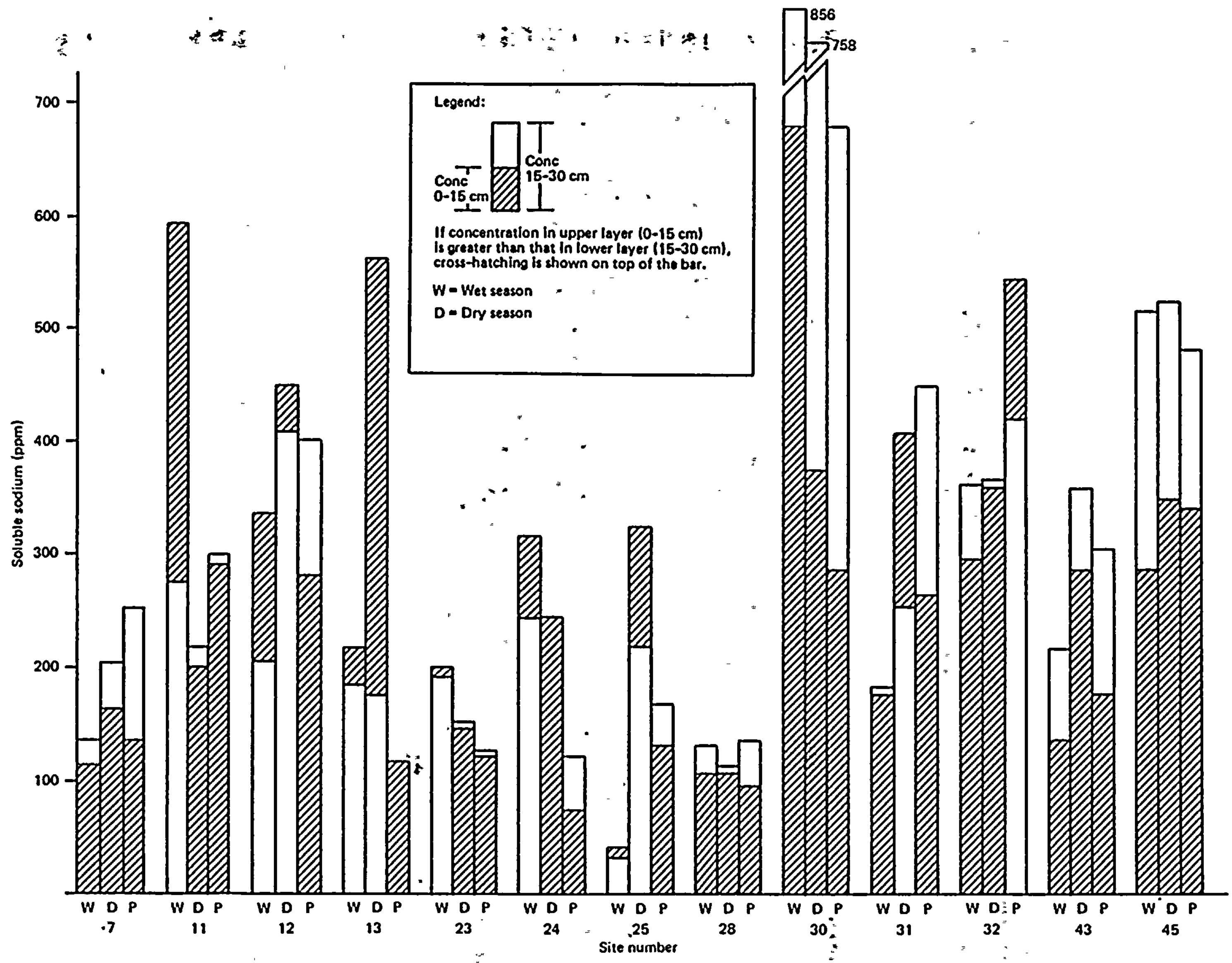


Figure 8-1. Mean concentrations of soluble sodium in soils at PVNGS agricultural monitoring sites, by depth and season, 1987

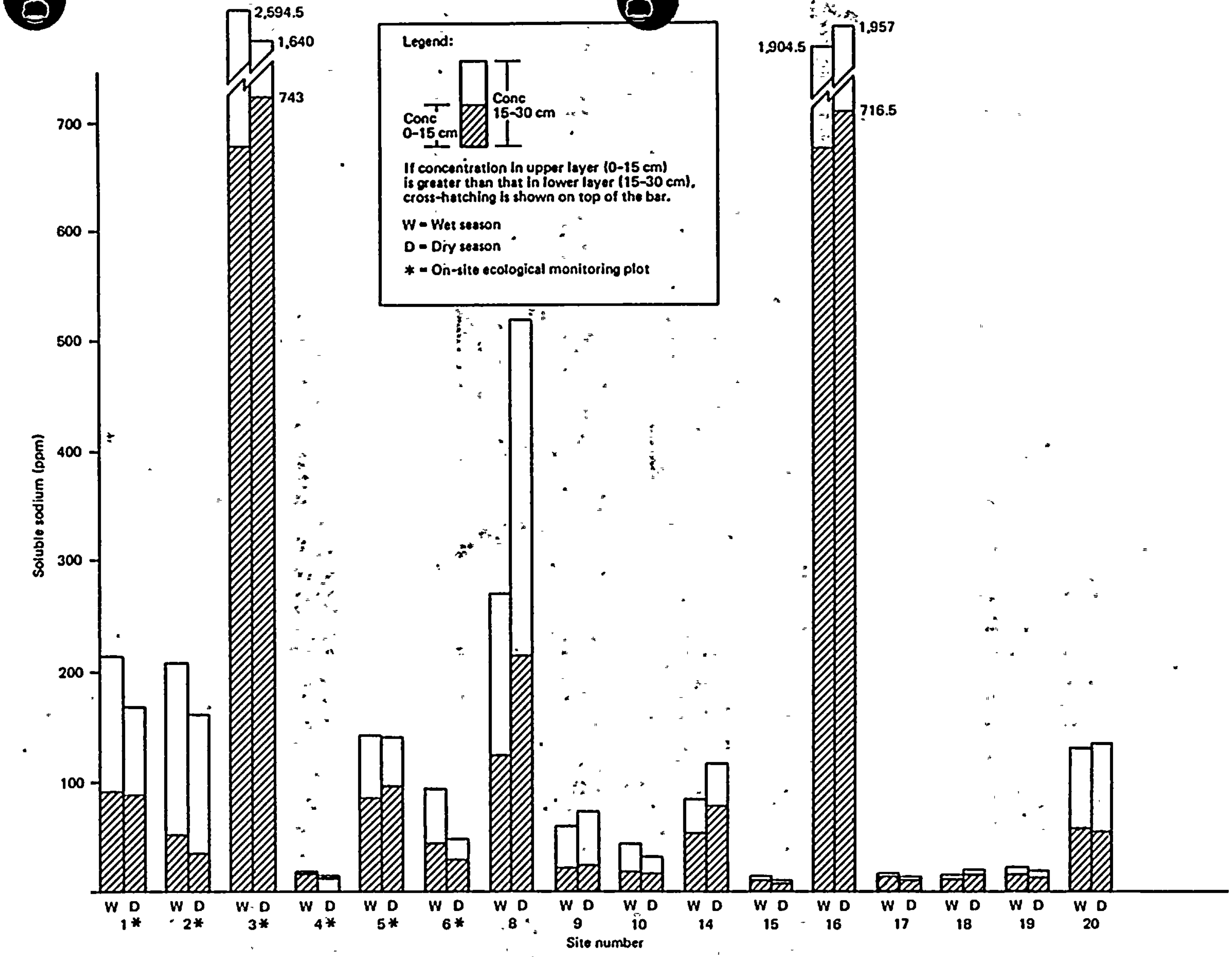


Figure 8-2. Mean concentrations of soluble sodium in soils at PVNGS native monitoring sites, by depth and season, 1987 (sheet 1 of 2)

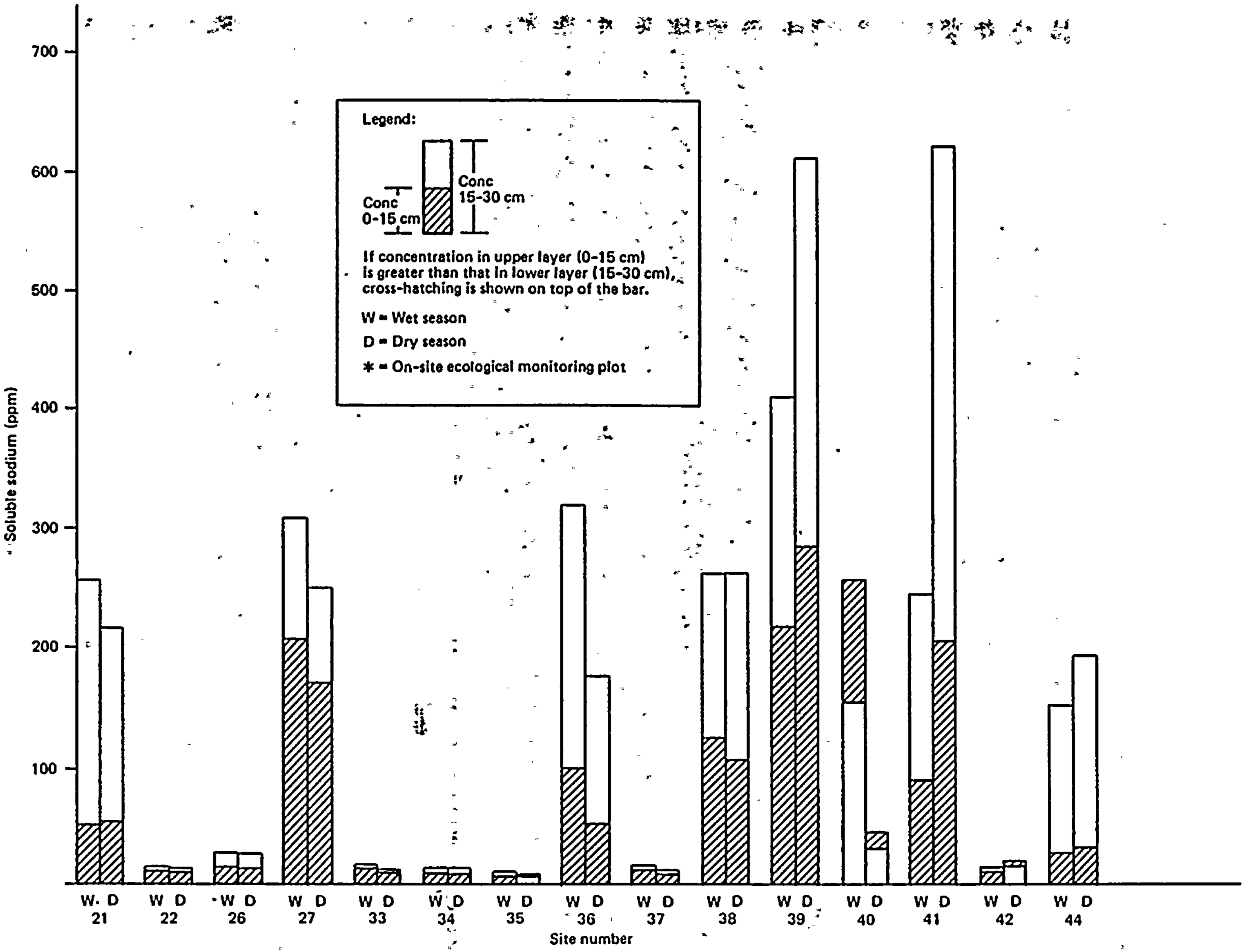


Figure 8-2. Mean concentrations of soluble sodium in soils at PVNGS native monitoring sites, by depth and season, 1987 (sheet 2 of 2)

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 1987 and for the period 1974-1985 are presented in Table 9-1. National Weather Service (NWS) Phoenix climatological data for 1987 and the period 1950-1980 are presented in Table 9-2. As reflected in the data, the precipitation at PVNGS was slightly lower and the wind speed slightly higher for 1987 than they were for the period 1974-1985. (Only during the summer and fall of 1987 were the monthly average wind speeds generally lower than the 1974-1985 averages.) The trends were the reverse for NWS Phoenix; the precipitation and wind speed for 1987 were higher and lower, respectively, than the averages for 1950-1980. The average 1987 temperatures for both PVNGS and NWS Phoenix were somewhat higher than the respective long-term averages. A comparison of the data presented in Tables 9-1 and 9-2 shows that, in terms of 1987 annual averages, both the temperature and dew point for PVNGS were 3°F lower than those for NWS Phoenix, and the precipitation for PVNGS was significantly lower than that for NWS Phoenix.

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

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

For 1987, temperature and humidity at PVNGS were near normal; precipitation was only slightly below normal, and there was slightly higher wind speeds (Tables 9-1 and 9-2). Overall, 1987 can be characterized as follows:

1. January, February, and July through December: wet, with more vegetative growth and runoff.

2. March through June: dry, with less vegetative growth and runoff.

9.2 DRIFT DEPOSITION

Monthly deposition of drift constituents calculated from samples collected during the preoperational period and 1987 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 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 1987) 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, 1985, and 1986, 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 1987. 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, nitrate, 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. Because of their importance, comparisons of nitrate and TSS were made, even though slightly more than 25 percent (27 and 28 percent, respectively) of their values were below the detection limit in 1987.

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 1987 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 five measurable ions and TSS for all agricultural sites (sites 7, 11-13, 23-25, 28, 30-32, 43, and 45) for the preoperational and 1987 data sets. As the table indicates, only the changes in mean annual potassium, calcium, and nitrate deposition rates were statistically significant between the two data sets, and only calcium had a higher deposition in 1987 than in the preoperational period.

Figures 9-1 through 9-3 show the mean monthly deposition for the preoperational and 1987 data sets for the combined agricultural sites. These figures reflect the large month-to-month variability in measured deposition rates for both data sets.

Table 9-4 presents annual deposition for sodium, potassium, and calcium, three prominent ions in the cooling tower basin water, for each agricultural site for the preoperational period and 1987. Although chloride was a prominent ion in the cooling tower basin water, deposition rates were not calculated because 53 percent of the data were below the detection limit. Also included in the table is an indication of those sites which had statistically significant changes between the two data periods.

Most of the changes in ionic deposition in 1987 that were statistically significant at some of the agricultural sites were decreases from preoperational means. Only site 23 sodium and calcium and site 31 calcium deposition

showed statistically significant increases between the preoperational period and 1987. Decreases in the deposition rates of sodium and calcium were also statistically significant at sites 25 and 45, respectively. Decreases in potassium deposition were statistically significant at sites 11, 25, 28, and 45. Sites 25 and 43 are agricultural control sites.

9.2.3 Drift Deposition at Native Sites

Table 9-5 presents the annual deposition of the five 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 1987. The changes between data sets in mean annual deposition for all ions and TSS were statistically significant. Of these changes, however, only sodium and calcium had increased between the preoperational period and 1987; the other changes were decreases.

Tables 9-6 through 9-9 present annual deposition of the five measurable ions and TSS for native sites at various distances from PVNGS for the preoperational period and 1987. 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, 10, and 19) and more than 2 miles (sites 4, 8, 9, 15, 17, 18, 21, 22, 26, 27, 33-42, and 44) from PVNGS, respectively.

Changes in sodium deposition rates were statistically significant at all distances, with increases in 1987 at all the native sites out to 2 miles and with decreases at those more than 2 miles away. With increasing distance from PVNGS, the mean annual sodium deposition and the magnitudes of the differences between preoperational and 1987 values decreased. Potassium showed significant decreases at all native sites except the supplemental sites between the preoperational period and 1987. Calcium significantly increased at all native sites up to 2 miles from PVNGS and decreased at those more than 2 miles away. Magnesium and nitrate showed significant decreases at the supplemental sites and at all native sites more than 1 mile away, but not at those within 1 mile. Total suspended solids decreased significantly at all native sites between the preoperational period and 1987.

Figures 9-4 through 9-6 show the mean monthly deposition for the preoperational period and for 1987 at all native sites. As with the agricultural sites, a large variability in deposition rates is evident from month-to-month for both periods for most ions.

Table 9-10 presents annual deposition for sodium, potassium, and calcium for each native site for the preoperational period and 1987. The table identifies individual sites that showed statistically significant changes in annual mean values between the preoperational period and 1987. The supplemental sites (sites 80-83) are discussed later in this section as a group.

Annual sodium deposition significantly increased at sites 1, 16, 19, and 20. Sites 1, 16, and 20 are onsite, and site 19 is about 2 miles west of Unit 2. Examination of the monthly data for the onsite monitoring locations (Appendix C) indicates that the largest increases occurred in January, September, and December 1987. Decreases in the sodium deposition rate were significant at site 39. Annual calcium deposition significantly increased at sites 1, 2, 6, and 14, all of which are onsite. The largest increases occurred in January, May, and December. Decreases in the calcium deposition rate were significant at sites 33 and 39. Neither potassium nor magnesium showed any significant increases in 1987. Decreases in the deposition rate of potassium were significant at sites 1, 3, 4, 5, 8, 14, 15, 27, and 33.

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 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 1987.

For the agricultural site pair the only significant change between the preoperational period and 1987 was a decrease in TSS. For the native site

pair the only significant change was a decrease in nitrate. Changes for all other analytes were not significant.

9.2.5 Deposition Measurement and Prediction

Table 9-12 provides estimated mean total and net TDS deposition in 1987 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 1987 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 3.00 ± 0.32 (Appendix B) was applicable. The last column in the table provides the estimated net deposition for each onsite location in 1987.

Assuming that the preoperational values would have been representative of 1987 absent any plant effects, any positive changes could be assumed to be from other sources, including the PVNGS cooling towers. By this analysis method, it was demonstrated that during 1987 the sites with the largest net deposition were those closest to the cooling towers and were along the axis of the predominant wind directions at PVNGS.

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 1987. For five 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 deposition values and the FOG code predictions for 1987, as shown by the low correlation coefficient (0.47). The FOG code predicts maximum deposition rates in the area of sites 16, 20, 80, 81, 82, and 83, which are the sites where the higher deposition rates were measured. Both measured and predicted deposition rates were highest at site 81. For those onsite locations at which there were significant increases, the average net measured deposition was about 84 percent of predicted values; individual site ratios ranged from 15 to 205 percent.

9.2.6 Deposition Summary and Conclusions

From analyses of the drift deposition in 1987, the following conclusions can be drawn:

1. There was a statistically significant increase in sodium and calcium deposition between the preoperational period and 1987 at the native sites within about 2 miles of PVNGS (sites 80-83; sites 3, 14, 16, and 20; and sites 1, 2, 5, 6, 10, and 19). Only site 19 is offsite. Significant increases in nitrate deposition were evident only at the supplemental monitoring sites (sites 80-83).

2. At native sites more than about 2 miles from PVNGS, the deposition rates of all ions were either significantly decreased or unchanged.

3. Of all the analytes, only calcium showed a statistically significant increase between the preoperational period and 1987 at the agricultural sites. No effects of the operation of the cooling towers on measured deposition were evident at even the closest of these sites.

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,d). The following sections compare the results of chemical and structural analyses for 1987 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 common and

consistently planted crop in the vicinity of PVNGS. On completion of harvest activities, some cotton fields were planted in barley before the next cotton growing season. Historically, the most common cotton grown in the area has been the upland (i.e., short-staple) variety; however, two monitoring sites (sites 24 and 25) have been planted in Pima (i.e., long-staple) cotton.

Alfalfa has been the second most frequently planted crop in the vicinity of PVNGS. This legume may remain 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 have included barley, sorghum, and melon.

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 1987 was limited to monitoring site 43 (Table 9-15). With the exception of potassium and chloride, there were no significant differences between the mean ionic concentrations in alfalfa leaf tissue for preoperational and 1987 periods at that site. The mean concentrations of potassium and chloride were significantly higher in 1987 than in the preoperational period. Because site 43, a control, lies well beyond the range of predicted drift deposition, the increase in ionic concentration for potassium and chloride in 1987 would appear to be unrelated to the emission of drift from PVNGS.

9.3.1.2 Cotton

The preoperational and 1987 ionic content of cotton leaf phytomass was evaluated at five monitoring sites: 11, 13, 25, 31, and 32 (Table 9-16). At all sites except site 31, the mean concentrations of sodium and calcium were significantly higher in 1987 than in the preoperational period. Site 31, which is southeast of PVNGS, had the fewest significant changes in ionic concentrations between the two comparison periods; magnesium was the only analyte whose concentration was significantly higher in 1987, and the concentrations of nitrate and fluoride were significantly lower in the operational period. At monitoring sites 11, 13, and 32, the mean ionic concentrations varied markedly between the preoperational period and 1987. Generally, the concentrations of sodium and calcium were significantly higher in 1987 at all

three sites; there was, however, no significant difference in the concentration of potassium at these sites.

Except for phosphate, the mean preoperational and 1987 concentrations of all anions varied markedly. In 1987 chloride was significantly higher at monitoring sites 11, 13 and 25 but showed no real change at sites 31 and 32; sulfate was significantly higher at sites 11 and 13 and significantly lower at site 31; and the mean level of nitrate was significantly lower at sites 11, 13, 31, and 32 but not significantly changed at site 25. Except for site 25, there was no significant difference in concentrations of phosphate between sites in 1987. Except at monitoring site 31, there were no significant differences between the concentrations of fluoride recorded in the preoperational period and 1987.

Monitoring site 25, which has been planted in Pima cotton each year since 1983 (Table 9-14) and serves as a control, showed significant increases in ionic concentrations between the preoperational period and 1987 for all selected ions except sulfate, nitrate, phosphate, and fluoride.

9.3.1.3 Cotton Yield

A comparison of the mean cotton yield for the period 1983-1987 at agricultural monitoring sites in the vicinity of PVNGS is presented in Table 9-17. Because of crop rotations, fallow fields, and the loss of samples due to a laboratory fire, comparisons of preoperational and 1987 yields were limited to sites 11, 13, 25, 31, and 32.

The mean yield of short-staple cotton at site 11 in 1987 was significantly higher than that for 1983. The mean yield at monitoring site 13 for 1987 was significantly greater than that reported for 1986 but not significantly different from the estimate for 1984. The mean yield of Pima cotton at monitoring site 25 in 1987 did not differ significantly from the mean yields for 1983, 1984, and 1986 but was significantly lower than that for 1985. At site 31 the mean yield of upland cotton did not vary significantly over the period 1984 through 1987; the mean yield in 1987, however, was significantly lower than that for 1983.

Detailed statistics for 1987 cotton yields in Arizona were unavailable at the time this report was written. However, preliminary statewide yields averaged 1396 pounds per acre for short-staple cotton and 1016 pounds per acre for long-staple cotton (Crisp, 1988). These values surpass the record high yields for the state in 1986. Historically, estimates of yield from NUS field studies have typically been higher than those compiled by the U.S. Department of Agriculture and the Arizona Agricultural Statistics Service because the removal of cotton lint by hand is a more efficient process than mechanical harvesting. The grand mean yields of cotton at sites 11 (3736 pounds per acre) and 13 (3319 pounds per acre) for 1986 and 1987 were higher than those for the preoperational period (2514 and 3201 pounds per acre, respectively). The grand mean yields for sites 25 (2143 pounds per acre), 31 (1453 pounds per acre), and 32 (1935 pounds per acre) for the preoperational period were higher than those for the operational period (1852, 1217, and 866 pounds per acre, respectively).

9.3.2 Native Vegetation

9.3.2.1 Creosote-Bush

The mean concentration of sodium in creosote-bush leaf tissue was significantly higher in 1987 than in the preoperational period at each location except control site 40 (Table 9-18); this site value was identical to the 1986 results (NUS, 1987b). However, the mean concentrations of potassium and calcium in 1987 were not significantly different from those of the preoperational period. Except at monitoring site 4, magnesium concentrations for the preoperational period and 1987 were not significantly different. The mean concentration of chloride was significantly higher in 1987 at monitoring sites 1 and 4, but there was no significant difference between the preoperational and 1987 concentrations at sites 6, 40, and 42. The mean concentrations of sulfate and nitrate were significantly lower in 1986 and 1987 than in the preoperational period at each monitoring site. Nitrate levels in 1987 were approximately one-tenth of those recorded during the preoperational period. The mean concentration of phosphate was significantly lower in 1987 at monitoring sites 4 and 6, but there was no real change at the other sites. The mean concentration of fluoride was significantly higher in 1987 than during the preoperational period at each monitoring site except site 42.

Generally, mean concentrations of sodium and fluoride in creosote-bush leaf tissue were higher in 1987 than in the preoperational period. Mean concentrations of sulfate and nitrate were significantly lower in 1986 and 1987 than during the preoperational period. With one exception, the concentrations of potassium, calcium, and magnesium in 1987 did not differ significantly from those of the preoperational period. The mean concentration of chloride was significantly higher in 1987 at two onsite locations but was unchanged at one onsite location and at both control sites.

An analysis of the phytosociological structure of the five creosote-bush communities for the preoperational and 1986-1987 periods is presented in Table 9-19. Generally, the perennial shrub stratum was monotypic at each of the five monitoring locations for both periods; creosote-bush was consistently the dominant perennial shrub in each community. Cover values for each of the five communities were similar for both comparison periods. Approximately 46 species of herbaceous flora have been tabulated since studies were initiated. Species with the highest frequency values included <u>Amsinckia intermedia</u>, <u>Chaenactis carphoclinia</u>, <u>Eriogonum Thomasii</u>, <u>Erodium texanum</u>, <u>Lepidium lasiocarpum</u>, <u>Pectocarya platycarpa</u>, and <u>Plantago insularis</u>. Of the six species of grass that were identified, <u>Schismus</u> sp. had the highest frequency. Six species of cacti were enumerated, most of which belonged to the genus <u>Opuntia</u>.

Species richness was similar for the preoperational and 1986-1987 periods at each of the five creosote-bush communities (Table 9-19). Onsite monitoring locations (sites 1, 4, and 6) had nearly twice the species richness as control sites 40 and 42. Heterogeneity was similar at monitoring sites 1, 4, and 40 but was higher in 1986-1987 at monitoring site 6. Conversely, heterogeneity was markedly higher at monitoring site 42 during the preoperational period than in the latter period. A comparison of similarity indices for the preoperational and 1986-1987 periods indicates a value of about 50 percent for each of the communities except site 4 (76 percent). These values indicate that the communities generally contained many of the same species in both comparison periods. One exception was monitoring site 4, which supported the greatest diversity of cacti.

9.3.2.2 Salt-Bush

Mean ionic concentrations of salt-bush leaf tissue during 1987 were generally different from those of the preoperational period at the onsite monitoring locations (sites 2 and 3) but showed little variation at the control site (site 44) (Table 9-20). The only significant change at site 44 was an increase in the concentration of sodium.

The mean concentration of sodium was significantly higher at all three monitoring sites in 1987 than in the preoperational period. Potassium was significantly higher at site 2, but there were no differences between the concentrations for the two periods at site 3 and the control site. There was also no significant change in the mean concentrations of calcium, chloride, and phosphate between the two periods at all three monitoring sites. Magnesium was significantly higher at monitoring sites 2 and 3 in 1987, but no difference between preoperational and 1987 concentrations was recorded at the control site. The mean concentrations of sulfate and nitrate were significantly lower in 1987 at sites 2 and 3 but did not differ from preoperational levels at the control site. Fluoride concentrations were significantly greater in 1987 at sites 2 and 3 than in the preoperational period; no significant change was evident at the control site.

Salt-bush communities had a more diverse shrub stratum than creosote-bush communities (Table 9-21). As measured by relative cover values, Atriplex polycarpa was the dominant perennial shrub species, and it underwent no significant structural change between the preoperational and 1986-1987 periods. Of the 32 species of herbaceous flora tabulated since 1983, those having the highest frequency included Amsinckia intermedia, Lepidium lasiocarpum, Plantago insularis, and Sphaeralcea Coulteri. Of the four species of grass occurring in the salt-bush communities, Schismus sp. had the highest frequency. Species richness and heterogeneity were generally higher at the onsite locations than at the control site, and they were lower during the 1986-1987 period. Indices of similarity for the monitoring sites showed little variability. Although there was some change in the frequency and diversity of ephemeral flora between the comparison periods, the relative cover values for the dominant flora remained similar. Thus, there was no

structural change in the salt-bush communities between the preoperational and 1986-1987 periods.

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 1987 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 1987 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 1987 and from 1983 through 1985 to define operational and preoperational data, respectively.

As described in the report for 1986 (NUS, 1987d), 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 1987 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 1987 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. The mean value for potassium was significantly lower in 1987 than in the preoperational period, and chloride was significantly higher. There were no significant differences between the preoperational and 1987 mean values for electrical conductivity, calcium, magnesium, and sodium.

The mean concentrations of indicator parameters for individual agricultural sites are given in Table 9-23. A comparison between preoperational and 1987 means shows that there were no significant differences for any of the indicator parameters at sites 11, 12, and 25. A significant increase in electrical conductivity was observed in 1987 for sites 31, 32, and 45; a significant decrease was observed for sites 7, 23, and 28. Mean calcium values were significantly higher at sites 13 and 28 and significantly lower at sites 7 and 23. No significant differences were observed for calcium at nine sites. Mean concentrations of magnesium were significantly higher at sites 13 and 24 and significantly lower at sites 7 and 23. No significant differences in magnesium concentrations were observed at nine sites. Sodium concentrations significantly increased at sites 31, 32, and 45 and significantly decreased at sites 23 and 28. No significant change in sodium content was observed at eight sites. Potassium concentrations were significantly higher only at site 32 and significantly lower at sites 23, 30, and 43. No significant differences in potassium concentrations were observed at nine sites. Chloride concentrations were significantly higher at sites 32 and 45 and significantly lower at site 23. No significant differences in chloride concentration were observed at 10 sites.

Monitoring locations showing significant increases in one or more soluble salts are found north (sites 13 and 24), south (sites 31 and 32), and southwest (sites 28 and 45) of the PVNGS site. Four of these locations (sites 24, 28, 32, and 45) are fallow fields and two (sites 13 and 31) are cotton fields. Sites showing significant decreases in one or more soluble salts are found northeast (site 7), southwest (sites 23, 28, and 30), and southeast (site 43) of the PVNGS site. Two of these locations (sites 7 and 28) are fallow fields, two (sites 23 and 43) are alfalfa fields, and one (site 30) is a cotton field.

There appeared to be no spatial trend reflecting significant changes in soluble salt content at the monitoring sites. It is most likely that irrigation management, cropping, and fertilizer application account for the statistical differences in the salt content of agricultural soils. For example, both alfalfa fields (sites 23 and 43) showed significant decreases, one (site 23) in all six parameters.

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 1987 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 there was no significant difference between the preoperational and 1987 mean values of calcium, magnesium, and potassium. Electrical conductivity and the concentrations of sodium and chloride were significantly higher in 1987 than in the preoperational period.

Mean values for individual native sites for the preoperational period and 1987 are given in Table 9-25. There was no significant difference between preoperational and 1987 values for any parameter at 11 of the 31 native sites (2, 3, 6, 8, 14, 16, 21, 27, 39, 41, and 44). These include four onsite locations as well as sites up to 11.5 miles away. Electrical conductivity values in 1987 were significantly higher than preoperational values at sites 17, 36, and 40 and significantly lower at six other sites (sites 4, 15, 18, 22, 26, and 34). No significant differences were found at the remaining 22 sites. Calcium concentrations were significantly higher during 1987 at six sites (sites 5, 17, 33, 35, 36, and 40) and significantly lower at site 9. There were no significant differences in calcium values at 24 of the 31 native sites. Magnesium values were significantly higher during 1987 at four sites (sites 5, 17, 36, and 40) and significantly lower at sites 9, 10, and 34, and there were no significant differences at the remaining 24 sites. Sodium concentrations increased significantly over preoperational values at sites 36, 40, and 42. There were no significant differences in sodium concentration at 28 of the 31 native sites. Potassium values were significantly higher during 1987 at site 17 and significantly lower at four sites (sites 10, 18, 22, and 26), and there were no differences at the remaining 26 sites. Chloride concentrations were significantly greater in 1987 than in the preoperational period at 14 sites (1, 4, 18, 19, 20, 26, 33, 34, 35, 36, 37, 38, 40, and 42) and were not significantly different at the other 17 native sites.

Sites 3, 4, 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. The only indicator parameter showing a significant change at these four sites was chloride at sites 4 and 20. Chloride also significantly increased at the three native sites farthest from the PVNGS site: sites 37, 40, and 42. This seems to indicate that there may be some other influence on chloride concentrations.

9.5 REMOTE SENSING/AERIAL PHOTOGRAPHY

Specifications and discussion of the 1987 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 a plant's normal physiology. Stress conditions associated with salt deposition or uptake include chlorosis of the leaves, marginal necrosis, premature leaf drop, wilting, and widespread mortality. 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 1987 revealed similar growth patterns at most of the monitoring sites. Salt stress symptoms such as chlorosis and necrosis of the leaves were not observed during ground-truthing. Furthermore, no evidence of significant, widespread vegetative stress in either agricultural crops or native plant communities was found. 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 soil fertility, drainage, and agricultural practices.

9.6 SUMMARY AND CONCLUSIONS

As in 1986, the results obtained from elements of the 1987 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 2 miles of PVNGS. Since the 1986 results did not produce such findings in any offsite area, 1987 operations appear to have slightly extended the range of influence of PVNGS cooling tower drift emissions.

Beyond the rather unambiguous indications of drift deposition measurements, however, the 1987 results from the other program elements are less definitive. As in 1986, although there are 1987 samples displaying statistically significant changes in specific ion concentrations in soils, native vegetation, and crop samples, these appear not to follow consistently any spatial or temporal patterns that can be correlated with PVNGS operations.

For example, sodium concentrations in onsite creosote-bush and salt-bush leaf tissue increased, paralleling the increase in the measured deposition of sodium in onsite samples, but soil samples did not display corresponding increases in soluble sodium content. However, sodium concentrations in the leaf tissue of these species also increased in offsite samples of native vegetation at two of three control sites, while there was no corresponding increase in sodium deposition. To further confound the picture, at only one of the three control sites did sodium content of both soil and leaf tissue increase; at the other two control sites, either an increase in soil was unmatched by one in leaf tissue, or vice-versa.

Similar inconsistencies can be identified in the agricultural monitoring. As in 1986, the changes observed from preoperational background for five analytes in deposition, soil, and vegetation samples were compiled for the agricultural monitoring sites and are presented in Table 9-26. As the table footnotes indicate, the indicated changes for most chloride analyses in deposition samples (and magnesium for one site) are based on a limited number of analyses above detectable limits and may be biased. Further, the changes indicated for alfalfa at site 23 are changes from 1986, since that site was planted in cotton during the preoperational period.

With these caveats, a review of the table indicates that

1. As in 1986, there are no cultivated sites at which significant changes occurred in the same parameter (analyte) for all media sampled.

2. The only site that displayed a significant increase in all five analytes in leaf tissue in 1987 was a control site (25) 19 miles from PVNGS; at the same site, deposition and soil samples all showed either decreases or no changes in the same parameters.

3. Site 11, the closest of the agricultural sites, which had shown increases in leaf tissue content of all five ions in 1986, showed increases in only three ions in 1987. Again as in 1986, no increases were observed for these three (or for the other two ions) in the deposition or soil samples.

4. Site 13 displayed parallel increases in the soil and leaf tissue content of two parameters (calcium and magnesium), but these parameters showed no change and a decrease, respectively, in deposition samples. In 1986, four of the five parameters had increased in leaf tissue, and soil values had increased for three.

5. Although these sites will continue to be monitored normally in the 1988 program, there would appear to be no basis for continuing the additional sampling of sites 11 and 13 that was instituted in 1987.

For 1987, it can be concluded that the cooling tower operations resulted in detectable deposition levels both onsite and at one offsite location about 2.3 miles west of the Unit 2 cooling towers. However, these deposition levels cannot be correlated with changes in soil and/or vegetation concentrations of the same analytes, nor can any structural or crop effects be identified that are attributable to the deposition measured in the offsite area.

Table 9-1. Monthly average meteorological data for PVNGS, 1987

Month	Temperature (°F)*		Dew point (°F)*		Precipitation (in.)		Wind speed (mph)*	
	1987	1974-1985	1987	1974-1985	1987	1974-1985	1987	1974-1985
January	50	52	27	33	0.44	0.58	4.9	4.8
February	57	56	30	32	0.51	0.59	6.9	5.5
March	61	61	27	34	0.03	0.82	7.0	6.7
April	75	68	29	31	0.00	0.19	7.7	7.3
May	79	78	40	35	0.08	0.12	7.5	7.7
June	90	89	35	37	0.00	0.03	7.1	7.7
July	90	92	43	57	0.50	0.64	7.5	7.8
August	90	90	56	56	0.43	0.53	7.6	7.1
September	84	85	45	53	0.32	0.59	6.5	6.8
October	77	72	44	42	0.85	0.60	5.5	5.6
November	59	59	36	33	0.97	0.74	5.2	5.1
December	48	52	33	33	1.33	0.70	5.1	4.6
Annual	72	71	37	40	5.46	6.13	6.5	6.4

*Based on measurement at 35 feet.

Table 9-2. Monthly average meteorological data for NWS Phoenix, 1987

Month	Temperature (°F)*		Dew point (°F)*		Precipitation (in.)*		Wind speed (mph)†	
	1987	1950-1980	1987	1950-1980‡	1987	1950-1980	1987	1950-1980
January	55	52	28	--	0.67	0.73	6.1	5.3
February	60	56	33	--	2.06	0.59	6.6	5.9
March	63	61	31	--	0.28	0.81	6.0	6.7
April	78	68	36	--	0.09	0.27	6.7	7.0
May	83	77	42	--	0.06	0.14	7.0	7.1
June	93	87	40	--	0.01	0.17	6.0	6.9
July	93	92	48	--	1.08	0.74	6.4	7.1
August	92	90	57	--	0.45	1.02	5.9	6.6
September	87	85	48	--	0.57	0.64	4.7	6.3
October	81	73	49	--	0.47	0.63	4.1	5.9
November	63	61	36	--	1.04	0.54	4.1	5.4
December	53	53	33	--	1.62	0.83	3.9	5.2
Annual	75	71	40	--	8.40	7.11	5.6	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 1987 (means ± standard errors)

Parameter	Preoperational* (n = 770)	1987 (n = 296)
Sodium	7.9 ± 0.3	7.3 ± 0.3
Potassium	8.6 ± 0.4[a]	7.0 ± 0.5[a]
Calcium	23.6 ± 0.8[a]	27.4 ± 1.6[a]
Magnesium	6.3 ± 0.3	5.9 ± 0.6
Nitrate (as N)	2.3 ± 0.1[a]	1.7 ± 0.1[a]
TSS	575.4 ± 29.2	494.7 ± 42.9

Key:
1. For individual parameters, means with superscript a are 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 1987 (means ± standard errors)

Site	Sodium		Potassium		Calcium	
	Preoperational*	1987	Preoperational*	1987	Preoperational*	1987
7	4.9 ± 0.6	5.0 ± 0.7	5.1 ± 0.5	3.2 ± 0.7	16.8 ± 1.6	17.3 ± 2.3
11	6.7 ± 0.6	7.0 ± 0.8	8.6 ± 0.8[a]	5.5 ± 0.9[a]	21.1 ± 1.7	21.4 ± 2.0
12	7.9 ± 1.2	6.5 ± 1.0	6.0 ± 0.9	8.8 ± 2.3	13.4 ± 1.2	27.9 ± 7.2
13	7.0 ± 0.9	5.4 ± 0.7	6.3 ± 0.7	4.1 ± 0.8	20.4 ± 2.4	16.3 ± 1.7
23	6.8 ± 0.8[a]	11.7 ± 1.5[a]	12.7 ± 1.6	19.0 ± 3.4	37.8 ± 4.0[a]	83.9 ± 9.2[a]
24	7.9 ± 1.2	4.9 ± 0.6	7.9 ± 1.3	6.6 ± 1.4	20.8 ± 2.9	16.4 ± 3.0
25	8.1 ± 1.0[a]	5.7 ± 0.5[a]	11.3 ± 1.0[a]	8.2 ± 1.0[a]	32.4 ± 2.1	30.6 ± 3.9
28	5.6 ± 0.5	5.5 ± 0.7	4.9 ± 0.6[a]	3.0 ± 0.5[a]	26.7 ± 3.2	22.4 ± 3.6
30	9.6 ± 0.8	11.0 ± 1.2	11.5 ± 1.4	13.9 ± 1.7	39.5 ± 3.5	53.3 ± 5.7
31	8.6 ± 0.7	8.2 ± 0.9	5.7 ± 0.6	4.5 ± 0.9	15.3 ± 1.3[a]	28.1 ± 5.8[a]
32	8.0 ± 0.8	6.0 ± 0.7	6.6 ± 0.8	4.6 ± 0.7	18.3 ± 1.8	19.4 ± 3.5
43	9.8 ± 1.1	8.9 ± 1.5	9.9 ± 1.1	9.8 ± 2.8	12.3 ± 1.0	14.8 ± 1.2
45	12.4 ± 1.6	9.6 ± 1.1	19.6 ± 5.2[a]	3.6 ± 0.6[a]	39.5 ± 7.5[a]	16.7 ± 2.5[a]

Key: For individual ions at each site, means with superscript a are 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 1987 (means ± standard errors)

Parameter	Preoperational* (n = 1835)	1987 (n = 837)
Sodium	5.7 ± 0.1	8.1 ± 0.4
Potassium	4.3 ± 0.1	3.5 ± 0.1
Calcium	11.1 ± 0.3	13.4 ± 0.6
Magnesium	2.6 ± 0.1	1.9 ± 0.1
Nitrate (as N)	1.8 ± 0.04	1.4 ± 0.04
TSS	228.2 ± 5.7	141.0 ± 3.8

Key: TSS, total suspended solids.

*May 1983 through December 1985.

Note: For each parameter, means of preoperational and 1987 values are significantly different at 95-percent confidence level.

Table 9-6. Annual mean deposition (lb/(acre)(yr)) of drift constituents at PVNGS supplemental monitoring sites, preoperational period and 1987 (means ± standard errors)

Parameter	Preoperational* (n = 662)	1987 (n = 96)
Sodium	5.7 ± 0.2[a]	20.8 ± 2.6[a]
Potassium	4.3 ± 0.2	3.9 ± 0.4
Calcium	13.0 ± 0.5[a]	17.8 ± 0.9[a]
Magnesium	3.1 ± 0.2[a]	2.5 ± 0.2[a]
Nitrate (as N)	1.7 ± 0.05[a]	2.4 ± 0.2[a]
TSS	248.2 ± 12.0[a]	173.0 ± 11.2[a]

Key:
1. For individual parameters, means with superscript a are 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 1987 (means ± standard errors)

Parameter	Preoperational* (n = 206)	1987 (n = 96)
Sodium	6.0 ± 0.3[a]	12.5 ± 1.8[a]
Potassium	4.7 ± 0.3[a]	3.4 ± 0.2[a]
Calcium	16.4 ± 1.1[a]	26.0 ± 4.4[a]
Magnesium	3.9 ± 0.4	3.5 ± 0.5
Nitrate (as N)	1.8 ± 0.1	1.8 ± 0.1
TSS	307.7 ± 22.2[a]	162.2 ± 12.1[a]

Key:
1. For individual parameters, means with superscript a are 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 1987 (means ± standard errors)

Parameter	Preoperational* (n = 366)	1987 (n = 143)
Sodium	5.6 ± 0.3	7.0 ± 0.3
Potassium	4.0 ± 0.2	3.2 ± 0.2
Calcium	11.3 ± 0.5	14.0 ± 0.7
Magnesium	2.7 ± 0.2	2.2 ± 0.2
Nitrate (as N)	1.7 ± 0.1	1.5 ± 0.1
TSS	225.0 ± 11.2	148.3 ± 8.4

Key: TSS, total suspended solids.

*May 1983 through December 1985.

Note: For each parameter, means of preoperational and 1987 values are significantly different at 95-percent confidence level.

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 1987 (means ± standard errors)

Parameter	Preoperational* (n = 1248)	1987 (n = 502)
Sodium	5.7 ± 0.2[a]	5.2 ± 0.1[a]
Potassium	4.4 ± 0.1[a]	3.5 ± 0.1[a]
Calcium	10.2 ± 0.3	10.0 ± 0.2
Magnesium	2.3 ± 0.1[a]	1.4 ± 0.05[a]
Nitrate (as N)	1.8 ± 0.04[a]	1.2 ± 0.04[a]
TSS	216.1 ± 6.7[a]	128.8 ± 4.8[a]

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

*May 1983 through December 1985.

Table 9-10. Annual deposition (lb/(acre)(yr)) of sodium, potassium, and calcium at PVNGS native monitoring sites preoperational period and 1987 (means ± standard errors) (sheet 1 of 2)

Site	Sodium		Potassium		Calcium	
	Preoperational*	1987	Preoperational*	1987	Preoperational*	1987
1	5.4 ± 0.6[a]	7.7 ± 0.8[a]	4.0 ± 0.5[a]	2.7 ± 0.3[a]	10.4 ± 0.7[a]	16.0 ± 2.2[a]
2	5.9 ± 0.6	7.5 ± 1.0	4.1 ± 0.5	3.2 ± 0.5	9.2 ± 0.7[a]	12.8 ± 1.2[a]
3	6.4 ± 0.6	7.8 ± 1.3	5.2 ± 0.6[a]	3.2 ± 0.4[a]	15.8 ± 2.8	11.7 ± 1.1
4	5.1 ± 0.6	6.1 ± 0.8	4.7 ± 0.7[a]	2.6 ± 0.4[a]	10.8 ± 1.1	12.9 ± 0.9
5	5.5 ± 0.6	5.7 ± 0.8	4.2 ± 0.6[a]	2.6 ± 0.4[a]	13.5 ± 1.9	11.4 ± 0.9
6	6.6 ± 0.6	6.6 ± 0.6	3.4 ± 0.3	3.5 ± 0.5	10.6 ± 1.0[a]	17.2 ± 2.5[a]
8	5.7 ± 0.7	5.2 ± 0.5	4.5 ± 0.8[a]	2.7 ± 0.5[a]	9.3 ± 1.0	10.3 ± 0.9
9	6.0 ± 0.7	6.2 ± 0.8	4.4 ± 0.5	3.3 ± 0.5	11.8 ± 1.5	13.9 ± 1.6
10	5.1 ± 0.6	6.6 ± 0.9	3.3 ± 0.3	3.2 ± 0.4	11.1 ± 1.3	14.2 ± 1.1
14	6.5 ± 0.8	8.0 ± 1.1	4.7 ± 0.5[a]	2.8 ± 0.4[a]	22.5 ± 2.0[a]	64.0 ± 15.0[a]
15	5.7 ± 0.6	4.8 ± 0.8	4.0 ± 0.4[a]	2.6 ± 0.4[a]	9.4 ± 0.7	11.3 ± 1.1
16	5.8 ± 0.7[a]	12.1 ± 2.3[a]	3.6 ± 0.4	3.4 ± 0.5	12.2 ± 1.1	15.4 ± 2.1
17	6.3 ± 0.9	5.8 ± 0.7	5.7 ± 0.6	3.9 ± 1.0	13.2 ± 1.5	10.3 ± 0.8
18	4.6 ± 0.5	5.8 ± 0.7	3.3 ± 0.3	4.0 ± 1.2	9.4 ± 0.9	9.4 ± 0.8
19	5.3 ± 0.7[a]	8.2 ± 0.9[a]	5.4 ± 0.6	4.3 ± 0.6	13.4 ± 1.3	12.0 ± 1.3
20	4.9 ± 0.6[a]	22.1 ± 6.2[a]	5.3 ± 0.7	4.1 ± 0.6	11.7 ± 0.9	12.9 ± 0.9
21	5.8 ± 1.0	5.6 ± 0.7	3.9 ± 0.4	3.9 ± 0.6	14.9 ± 3.6	10.1 ± 0.7
22	4.7 ± 0.5	4.9 ± 0.6	4.1 ± 0.6	3.1 ± 0.5	9.0 ± 0.6	9.5 ± 0.6
26	6.4 ± 0.9	5.1 ± 0.6	3.5 ± 0.4	3.0 ± 0.6	9.8 ± 0.7	8.9 ± 0.6
27	5.4 ± 0.5	5.1 ± 0.6	5.3 ± 0.7[a]	3.3 ± 0.5[a]	14.0 ± 2.3	10.0 ± 0.5
33	6.0 ± 0.6	4.5 ± 0.6	5.2 ± 0.6[a]	3.2 ± 0.7[a]	11.5 ± 1.1[a]	8.7 ± 0.5[a]
34	5.7 ± 0.6	4.8 ± 0.7	4.0 ± 0.5	3.7 ± 0.9	7.5 ± 0.6	10.7 ± 1.9
35	5.8 ± 0.9	5.8 ± 0.8	6.0 ± 0.8	4.4 ± 0.8	11.5 ± 1.3	9.2 ± 0.9
36	4.9 ± 0.6	4.7 ± 0.6	3.4 ± 0.3	2.8 ± 0.5	6.9 ± 0.5	7.4 ± 0.6

Table 9-10. Annual deposition (lb/(acre)(yr) of sodium, potassium, and calcium at PVNGS native monitoring sites, preoperational period and 1987 (means ± standard errors) (sheet 2 of 2)

Site	Sodium		Potassium		Calcium	
	Preoperational*	1987	Preoperational*	1987	Preoperational*	1987
37	5.5 ± 0.7	5.5 ± 0.9	3.7 ± 0.5	3.0 ± 0.5	7.1 ± 0.5	7.4 ± 0.7
38	6.2 ± 0.7	5.2 ± 0.6	5.1 ± 0.7	3.5 ± 0.6	8.6 ± 0.7	8.7 ± 0.5
39	6.0 ± 0.8[a]	4.1 ± 0.5[a]	4.3 ± 0.6	3.1 ± 0.6	9.0 ± 0.8[a]	7.1 ± 0.4[a]
40	6.0 ± 0.7	5.2 ± 0.5	4.5 ± 0.4	4.6 ± 0.5	12.8 ± 1.0	13.6 ± 1.2
41	6.2 ± 0.9	5.1 ± 0.6	4.7 ± 0.8	3.9 ± 0.8	11.9 ± 1.5	12.4 ± 1.5
42	5.3 ± 0.6	4.6 ± 0.8	3.7 ± 0.7	4.3 ± 1.1	7.6 ± 0.5	8.1 ± 0.8
44	6.0 ± 1.0	4.6 ± 0.7	3.4 ± 0.6	3.6 ± 0.8	7.8 ± 0.7	9.4 ± 1.2
80	5.7 ± 0.2[a]	14.1 ± 2.3[a]	4.3 ± 0.2	3.7 ± 0.6	13.0 ± 0.5[a]	23.0 ± 2.9[a]
81	5.7 ± 0.2[a]	31.8 ± 5.8[a]	4.3 ± 0.2	4.6 ± 0.9	13.0 ± 0.5[a]	16.1 ± 1.4[a]
82	5.7 ± 0.2[a]	12.8 ± 3.0[a]	4.3 ± 0.2	3.6 ± 0.6	13.0 ± 0.5[a]	16.7 ± 1.4[a]
83	5.7 ± 0.2[a]	24.4 ± 7.3[a]	4.3 ± 0.2	3.7 ± 0.8	13.0 ± 0.5[a]	15.6 ± 0.8[a]

Key: For individual ions at each site, means with superscript a are 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 1987 (means ± standard errors)

Parameter	Agricultural control sites (sites 25 and 43) Preoperational* (n = 120)	Agricultural control sites (sites 25 and 43) 1987 (n = 45)	Native control sites (sites 40 and 42) Preoperational* (n = 119)	Native control sites (sites 40 and 42) 1987 (n = 46)
Sodium	8.9 ± 0.7	7.2 ± 0.8	5.7 ± 0.5	4.9 ± 0.5
Potassium	10.6 ± 0.7	8.9 ± 1.4	4.1 ± 0.4	4.5 ± 0.6
Calcium	22.5 ± 1.5	23.2 ± 2.4	10.4 ± 0.6	10.8 ± 0.8
Magnesium	7.4 ± 0.6	6.3 ± 1.0	2.9 ± 0.3	2.3 ± 0.3
Nitrate (as N)	2.1 ± 0.1	1.8 ± 0.2	1.8 ± 0.1[a]	1.2 ± 0.1[a]
TSS	728.9 ± 57.4[a]	502.6 ± 77.6[a]	264.1 ± 22.9	225.0 ± 27.8

Key:
1. For individual parameters, means with superscript a are 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, 1987 (means ± standard errors)

Site	Deposition			
	Sodium 1987	Sodium preoperational†	Net sodium 1987	Net total 1987*
1	7.7 ± 0.8	5.4 ± 0.6	2.3 ± 1.0	6.9 ± 3.1
2	7.5 ± 1.0	5.9 ± 0.6	1.6 ± 1.2	4.8 ± 3.6
3	7.8 ± 1.3	6.4 ± 0.6	1.4 ± 1.4	4.2 ± 4.2
4	6.1 ± 0.8	5.1 ± 0.6	1.0 ± 1.0	3.0 ± 3.0
5	5.7 ± 0.8	5.5 ± 0.6	0.2 ± 1.0	0.6 ± 3.0
6	6.6 ± 0.6	6.6 ± 0.6	0.0 ± 0.8	0.0 ± 2.4
10	6.6 ± 0.9	5.1 ± 0.6	1.5 ± 1.1	4.5 ± 3.3
14	8.0 ± 1.1	6.5 ± 0.8	1.5 ± 1.4	4.5 ± 4.2
16	12.1 ± 2.3	5.8 ± 0.7	6.3 ± 2.4	18.9 ± 7.5
20	22.1 ± 6.2	4.9 ± 0.6	17.2 ± 6.2	51.6 ± 19.4
27	5.1 ± 0.6	5.4 ± 0.5	-0.3 ± 0.8	-0.9 ± 2.4
80	14.1 ± 2.3	5.7 ± 0.2	8.4 ± 2.3	25.2 ± 7.4
81	31.8 ± 5.8	5.7 ± 0.2	26.1 ± 5.8	78.3 ± 19.3
82	12.8 ± 3.0	5.7 ± 0.2	7.1 ± 3.0	21.3 ± 9.3
83	24.4 ± 7.3	5.7 ± 0.2	18.7 ± 7.3	56.1 ± 22.7

*Based on scaling measured sodium deposition at each monitoring site by ratio of total dissolved solids to sodium (3.0 ± 0.32) as determined from monthly 1987 cooling tower basin water samples from Units 1-3.

†For May 1983 through December 1985.

Table 9-13. Measured versus predicted drift deposition (lb/(acre)(year)) at PVNGS onsite monitoring sites, 1987

Site	Net deposition* (measured)	FOG-code-predicted total deposition	Measured/ predicted (ratio)
1	6.9 ± 3.1	5.8	1.19
2	4.8 ± 3.6	3.4	1.41
3	4.2 ± 4.2†	8.8	NC
4	3.0 ± 3.0†	1.2	NC
5	0.6 ± 3.0†	0.4	NC
6	0.0 ± 2.4†	0.6	NC
10	4.5 ± 3.3	2.2	2.05
14	4.5 ± 4.2	28.0	0.16
16	18.9 ± 7.5	90.0	0.21
20	51.6 ± 19.4	36.0	1.43
27	-0.9 ± 2.4†	1.1	NC
80	25.2 ± 7.4	140.0	0.18
81	78.3 ± 19.3	510.0	0.15
82	21.3 ± 9.3	48.0	0.44
83	56.1 ± 22.7	49.0	1.14
Mean ratio			0.84

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 = 15.9 (intercept)
B = 0.12 (slope)
X = predicted deposition
Correlation coefficient (R^2) = 0.47

Table 9-14. Sequence of crops planted at PVNGS agricultural monitoring sites, 1983-1987

Monitoring site	1983	1984	1985	1986	1987
7	Cotton	Fallow	Fallow	Fallow	Fallow
11	Cotton	Cotton*	Cotton	Cotton	Cotton
12	Cotton	Cotton	Cotton	Fallow	Fallow
13	Sorghum	Cotton	Cotton	Cotton	Cotton
23	Cotton	Cotton	Cotton	Alfalfa	Alfalfa
24	Fallow	Pima cotton*	Pima cotton	Fallow	Fallow
25	Pima cotton	Pima cotton	Pima cotton	Pima cotton	Pima cotton
28	Fallow	Cotton*	Fallow	Fallow	Fallow
29†	Alfalfa	Discontinued	Discontinued	Discontinued	Discontinued
30	Melon	Fallow	Barley/cotton	Cotton	Alfalfa
31	Cotton	Cotton	Cotton	Cotton	Cotton
32	Cotton	Cotton	Cotton	Fallow	Cotton
43	Alfalfa	Alfalfa	Alfalfa	Alfalfa	Alfalfa
45‡	--	Cotton	Alfalfa	Fallow	Fallow

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

†Discontinued after 1983 growing season.

‡Established in 1984.

Table 9-15. Preoperational and 1987 mean ion content ($\mu g/g$ dry weight) of alfalfa leaf tissue at PVNGS monitoring site 43 (means $\pm$ standard errors)

Ion	1983-1985 (n = 40)	1987 (n = 10)
Sodium	1,547 ± 129[a]	2,053 ± 345[a]
Potassium	22,194 ± 944	26,230 ± 672
Calcium	12,026 ± 424[a]	13,817 ± 346[a]
Magnesium	2,705 ± 77[a]	2,704 ± 55[a]
Chloride	11,951 ± 606	17,036 ± 506
Sulfate	11,283 ± 1080[a]	11,088 ± 806[a]
Nitrate (as N)	302 ± 59[a]	489 ± 52[a]
Phosphate (as P)	3,010 ± 91[a]	3,128 ± 67[a]
Fluoride	14.1 ± 1.7[a]	10.1 ± 0.6[a]

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

Table 9-16. Preoperational and 1987 mean ionic content (μg/g dry weight) of cotton leaf tissue at PVNGS monitoring sites (means ± standard errors)

Ion	Site 11		Site 13		Site 25		Site 31		Site 32	
	1983-1985	1987	1984-1985	1987	1983-1985	1987	1983-1985	1987	1983-1985	1987
Sodium	2,159 ± 149[a] (n = 50)	4,180 ± 345[a] (n = 30)	3,310 ± 271[a] (n = 40)	5,637 ± 475[a] (n = 30)	443 ± 30[a] (n = 59)	556 ± 24[a] (n = 20)	9,062 ± 830 (n = 60)	8,178 ± 876 (n = 20)	10,204 ± 739[a] (n = 60)	14,408 ± 960[a] (n = 20)
Potassium	15,312 ± 647 (n = 50)	16,534 ± 739 (n = 30)	16,943 ± 592 (n = 40)	17,246 ± 796 (n = 30)	17,134 ± 728[a] (n = 59)	21,230 ± 831[a] (n = 20)	15,060 ± 1,181 (n = 60)	13,623 ± 626 (n = 20)	14,312 ± 1,006 (n = 60)	13,341 ± 504 (n = 20)
Calcium	30,187 ± 997[a] (n = 50)	42,004 ± 2,467[a] (n = 30)	33,836 ± 1,038[a] (n = 40)	43,413 ± 1,268[a] (n = 30)	32,842 ± 1,357[a] (n = 59)	43,863 ± 2,610[a] (n = 20)	33,426 ± 2,679 (n = 60)	34,942 ± 1,897 (n = 20)	28,234 ± 1,393[a] (n = 60)	34,581 ± 1,159[a] (n = 20)
Magnesium	4,612 ± 122 (n = 50)	5,052 ± 191 (n = 30)	5,378 ± 170[a] (n = 40)	5,924 ± 127[a] (n = 30)	3,477 ± 90[a] (n = 59)	4,078 ± 196[a] (n = 20)	6,041 ± 324[a] (n = 60)	7,488 ± 472[a] (n = 20)	5,496 ± 199[a] (n = 60)	6,950 ± 182[a] (n = 20)
Chloride	13,617 ± 341[a] (n = 50)	17,227 ± 516[a] (n = 30)	16,377 ± 597[a] (n = 40)	19,363 ± 428[a] (n = 30)	14,700 ± 518[a] (n = 59)	17,836 ± 656[a] (n = 20)	15,612 ± 972 (n = 60)	17,836 ± 620 (n = 20)	15,638 ± 795 (n = 60)	17,734 ± 393 (n = 20)
Sulfate	30,560 ± 1,418[a] (n = 50)	43,421 ± 1,697[a] (n = 30)	33,600 ± 1,740[a] (n = 40)	41,973 ± 1,549[a] (n = 30)	26,062 ± 1,497 (n = 59)	28,603 ± 1,722 (n = 20)	48,621 ± 4,569 (n = 60)	37,842 ± 3,200 (n = 20)	51,530 ± 4,323[a] (n = 60)	35,995 ± 1,789[a] (n = 20)
Nitrate (as N)	653 ± 97[a] (n = 40)	202 ± 22[a] (n = 30)	715 ± 136[a] (n = 32)	176 ± 14[a] (n = 30)	635 ± 105 (n = 49)	302 ± 62 (n = 20)	408 ± 64[a] (n = 50)	141 ± 18[a] (n = 20)	738 ± 105[a] (n = 50)	167 ± 29[a] (n = 20)
Phosphate (as P)	2,425 ± 107 (n = 50)	2,104 ± 127 (n = 30)	1,831 ± 103 (n = 40)	2,156 ± 122 (n = 30)	2,612 ± 96 (n = 59)	2,384 ± 69 (n = 20)	2,672 ± 204 (n = 60)	2,082 ± 95 (n = 20)	2,538 ± 111 (n = 60)	2,224 ± 53 (n = 20)
Fluoride	89 ± 55 (n = 42)	12 ± 1 (n = 30)	100 ± 46 (n = 34)	11.9 ± 0.5 (n = 30)	10.2 ± 1.2 (n = 50)	13.6 ± 0.4 (n = 20)	19 ± 3[a] (n = 50)	9 ± 0[a*] (n = 20)	35 ± 15 (n = 51)	13 ± 1 (n = 20)

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

*Difference statistics may be biased because sample means were not based on a normal distribution.

Table 9-17. Mean cotton yield (lb/acre) at PVNGS agricultural monitoring sites, 1983-1987 (means ± standard errors)

Monitoring site	1983 (n = 10)	1984 (n = 10)	1985 (n = 10)	1986 (n = 10)	1987 (n = 10)
7	749 ± 127	Fallow	Fallow	Fallow	Fallow
11	2514 ± 184[a]	Fallow	Fallow	--	3736 ± 225[b]
12	--	2787 ± 139[a]	2314 ± 208[a]	Fallow	Fallow
13	Sorghum	3201 ± 99[ab]	--	3029 ± 194[a]	3608 ± 170[b]
23	2463 ± 296[a]	1375 ± 124[b]	1894 ± 303[ab]	Alfalfa	Alfalfa
24	Fallow	948 ± 57[a]	1423 ± 356[a]	Fallow	Fallow
25	2088 ± 162[a]	1460 ± 68[b]	2880 ± 220[c]	1970 ± 354[ab]	1733 ± 167[ab]
28	Fallow	1595 ± 64	Fallow	Fallow	Fallow
30	Melon	Fallow	2470 ± 173[a]	1569 ± 47[b]	Alfalfa
31	1860 ± 210[a]	1330 ± 178[b]	1169 ± 142[b]	1205 ± 78[b]	1229 ± 72[b]
32	1316 ± 173[a]	2486 ± 189[b]	2002 ± 213[b]	Fallow	866 ± 89[a]
45	NA	2294 ± 184	Alfalfa	Fallow	Fallow

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

Table 9-18. Preoperational and 1987 mean ionic content (μg/g dry weight) of creosote-bush (Larrea divaricata) leaf tissue at PVNGS monitoring sites (means ± standard errors)

	Site 1		Site 4		Site 6		Site 40		Site 42	
Ion	1983-1985	1987	1983-1985	1987	1983-1985	1987	1983-1985	1987	1983-1985	1987
Sodium	309 ± 28[a] (n = 50)	502 ± 21[a] (n = 20)	357 ± 27[a] (n = 50)	534 ± 23[a] (n = 20)	285 ± 26[a] (n = 50)	487 ± 24[a] (n = 20)	395 ± 106 (n = 50)	490 ± 24 (n = 20)	250 ± 28[a] (n = 50)	392 ± 13[a] (n = 20)
Potassium	8,589 ± 448 (n = 50)	9,108 ± 316 (n = 20)	13,876 ± 488 (n = 50)	12,931 ± 503 (n = 20)	10,579 ± 538 (n = 50)	10,014 ± 458 (n = 20)	11,154 ± 678 (n = 50)	13,212 ± 430 (n = 20)	10,906 ± 639 (n = 50)	10,923 ± 608 (n = 20)
Calcium	16,117 ± 694 (n = 50)	16,849 ± 622 (n = 20)	13,307 ± 307 (n = 50)	13,418 ± 786 (n = 20)	16,972 ± 503 (n = 50)	16,058 ± 586 (n = 20)	17,250 ± 3,010 (n = 50)	13,863 ± 453 (n = 20)	16,348 ± 1,816 (n = 50)	17,165 ± 526 (n = 20)
Magnesium	1,523 ± 59 (n = 50)	1,521 ± 76 (n = 20)	1,388 ± 39[a] (n = 50)	1,661 ± 59[a] (n = 20)	1,681 ± 62 (n = 50)	1,619 ± 88 (n = 20)	1,424 ± 94 (n = 50)	1,455 ± 83 (n = 20)	1,488 ± 89 (n = 50)	1,408 ± 49 (n = 20)
Chloride	6,086 ± 259[a] (n = 50)	7,698 ± 335[a] (n = 20)	6,462 ± 347[a] (n = 50)	8,214 ± 420[a] (n = 20)	6,609 ± 244 (n = 50)	7,440 ± 218 (n = 20)	6,691 ± 277 (n = 50)	6,542 ± 243 (n = 20)	7,072 ± 324 (n = 50)	7,180 ± 279 (n = 20)
Sulfate	17,538 ± 1,687[a] (n = 50)	2,525 ± 145[a] (n = 20)	8,680 ± 528[a] (n = 50)	4,673 ± 363[a] (n = 20)	8,894 ± 550[a] (n = 50)	3,644 ± 217[a] (n = 20)	11,484 ± 744[a] (n = 50)	3,527 ± 289[a] (n = 19)	15,042 ± 1,548[a] (n = 50)	4,262 ± 313[a] (n = 20)
Nitrate (as N)	1,338 ± 311[a] (n = 40)	36.4 ± 4.0[a] (n = 20)	415 ± 71[a] (n = 42)	46.2 ± 2.6[a] (n = 20)	380 ± 61[a] (n = 40)	31.2 ± 3.0[a] (n = 20)	422 ± 69[a] (n = 40)	40.1 ± 2.9[a] (n = 20)	417 ± 64[a] (n = 40)	51.1 ± 7.5[a] (n = 20)
Phosphate (as P)	969 ± 28 (n = 50)	988 ± 45 (n = 20)	1,106 ± 35[a] (n = 50)	967 ± 38[a] (n = 20)	1,411 ± 42[a] (n = 50)	1,186 ± 50[a] (n = 20)	1,464 ± 72 (n = 50)	1,333 ± 20 (n = 20)	1,330 ± 41 (n = 50)	1,311 ± 91 (n = 20)
Fluoride	11.1 ± 1.5[a] (n = 40)	19.0 ± 0.5[a] (n = 20)	9.4 ± 1.5[a] (n = 40)	16.4 ± 0.5[a] (n = 20)	10.0 ± 1.4[a] (n = 40)	17.3 ± 0.5[a] (n = 20)	9.5 ± 1.3[a] (n = 40)	17.8 ± 0.4[a] (n = 20)	10.7 ± 1.3 (n = 40)	14.2 ± 0.5 (n = 20)

Key: For individual ions at same site, means with superscript a are 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 (Preop) and 1986-1987 (Op) periods at PVNGS monitoring sites (sheet 1 of 2)

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											
SHRUBS											
Larrea divaricata	Creosote-bush	18.2	19.2	13.4	12.4	20.2	19.7	12.4	12.6	17.4	20.1
HERBS											
Ambrosia dumosa	Ragweed	1.1	1.8								
Amsinckia intermedia	Fiddle-neck	0.5	<0.1	<0.1	<0.1	1.4	0.4	<0.1	0.1	0.1	0.1
Argythamnia neomexicana	None	<0.1									
Astragalus Nuttallianus	Milk-vetch			<0.1	0.1	<0.1	0.1				
Bowlesia incana	None		<0.1								
Brassica Tournefortii	None			<0.1	0.3		<0.1				
Camelina microcarpa	False-flax			<0.1							
Chaenactis carphoclinia	None	0.2	<0.1	0.2	0.1					<0.1	<0.1
Chaenactis Freemonti	None		<0.1		<0.1						<0.1
Chorizanthe rigida	None	<0.1	<0.1	0.1	<0.1		<0.1				
Cryptantha augustifolia	None			<0.1	<0.1	<0.1					
Cryptantha inaequata	None	<0.1									
Cryptantha maritima	None		<0.1							0.1	
Cryptantha pterocarya	None		<0.1								
Cryptantha sp.	None		<0.1		<0.1		0.1				<0.1
Dalea neomexicana	Indigo-bush, pea-bush									0.1	
Daucus pusillus	Carrot	<0.1	0.8								
Eriastrum diffusum	None	<0.1									
Erigeron lobatus	Fleabane, wild-daisy		<0.1								
Eriogonum Thomasii	Wild-buckwheat	0.1	<0.1	<0.1	0.1	<0.1	0.2			<0.1	0.3
Eriogonum trichopes	Wild-buckwheat			0.1	<0.1	<0.1				0.8	
Eriophyllum lanosum	Wooly-daisy	0.1				<0.1					
Erodium cicutarium	Heron-bill		<0.1				<0.1				
Erodium texanum	Heron-bill	0.9	0.6	0.1	<0.1	0.1	0.1			<0.1	<0.1
Euphorbia polycarpa	Spurge					<0.1		2.0			
Euphorbia sp.	Spurge					<0.1					
Filago arizonica	None	0.1									
Hesperocallis undulata	Desert-lily			<0.1	<0.1						
Lepidium lasiocarpum	Pepper-grass	0.2	0.1	0.1	0.1	0.1	0.1		<0.1	0.7	
Lepidium virginicum	Pepper-grass	<0.1		<0.1		<0.1		<0.1		<0.1	
Lepidium sp.	Pepper-grass		<0.1		<0.1		<0.1		<0.1		<0.1
Lesquerella Gordoni	Bladder-pod				0.4			<0.1	0.1		
Linanthus dichotomus	None	0.1				<0.1					
Lotus salsuginosus	Deer-vetch				<0.1						<0.1
Lotus tomentellus	Deer-vetch					<0.1	<0.1				

Table 9-19. Species composition, cover, and diversity of flora in five creosote-bush (*Larrea divaricata*) communities during preoperational (Preop) and 1986-1987 (Op) periods at PVNGS monitoring sites (sheet 2 of 2)

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)											
Lupinus sparsiflorus	Lupine					0.1	0.1				
Machaeranthera arida	None		<0.1		<0.1		<0.1				
Monoptilon bellioides	None		<0.1				<0.1				
Nemacladus glanduliferus	None	0.1									
Oligomeris linifolia	None	<0.1		<0.1	<0.1						
Orthocarpus purpurascens	Owl-clover		<0.1	<0.1	<0.1		<0.1				<0.1
Pectis papposa	Fetid-marigold	<0.1		<0.1		<0.1		<0.1			
Pectocarya platycarpa	None	0.2	<0.1	0.2	<0.1	0.1	0.4			0.2	<0.1
Phacelia crenulata	None	<0.1	<0.1	<0.1	<0.1						
Plantago insularis	Plaintain	1.1	1.6	3.5	7.4	0.5	4.8	8.1	4.5	0.7	0.6
Spermolepis echinata	None	0.6									
Sphaeralcea Coulteri	Globe-mallow							16.0	0.1		
GRASSES											
Aristida adscensionis	Three-awn	<0.1									
Aristida sp.	Three-awn	<0.1									
Bouteloua barbata	Gamma	<0.1		<0.1		<0.1		<0.1			
Bromus rubens	Foxtail brome	<0.1	0.3			<0.1	0.4	<0.1			
Festuca octoflora	Fescue	0.4	0.5			0.4					
Schismus arabicus	None			<0.1	<0.1				1.5		0.1
Schismus barbatus	None	0.6		1.8		<0.1		0.3		0.7	
Schismus sp.			0.4		0.8		3.7		5.9		1.6
CACTI											
Echinocereus sp.	Hedgehog cactus				<0.1						
Opuntia acanthocarpa	None			0.3	<0.1	<0.1				<0.1	<0.1
Opuntia echinocarpa	None			0.1	<0.1						<0.1
Opuntia leptocaulis	Christmas cactus	<0.1									
Opuntia ramossisima	None			0.5	0.1					<0.1	<0.1
Diversity and plot size											
Species richness		30	26	26	29	23	20	11	9	15	17
Heterogeneity (H')		.52	.46	.52	.49	.25	.50	.54	.54	.72	.23
Index of similarity (%)		50		76		47		50		56	
Number of plots		53	40	50	40	50	40	50	40	50	40

Table 9-20. Preoperational and 1987 mean 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	1987	1983-1985	1987	1984-1985	1987
Sodium	48,721 ± 1,077[a] (n = 50)	60,830 ± 3,599[a] (n = 20)	51,417 ± 1,296[a] (n = 50)	64,007 ± 3,738[a] (n = 20)	33,564 ± 1,082[a] (n = 40)	45,471 ± 2,459[a] (n = 20)
Potassium	13,328 ± 888[a] (n = 50)	19,179 ± 1,220[a] (n = 20)	17,207 ± 969 (n = 50)	20,224 ± 1,559 (n = 20)	22,612 ± 1,324 (n = 40)	24,332 ± 1,302 (n = 20)
Calcium	11,887 ± 1,153 (n = 50)	13,990 ± 824 (n = 20)	13,333 ± 1,767 (n = 50)	14,632 ± 823 (n = 20)	9,175 ± 346 (n = 40)	9,257 ± 492 (n = 20)
Magnesium	4,359 ± 257[a] (n = 50)	5,943 ± 481[a] (n = 20)	5,721 ± 243[a] (n = 50)	7,510 ± 429[a] (n = 20)	8,038 ± 1,831 (n = 40)	6,957 ± 451 (n = 20)
Chloride	59,225 ± 4,683 (n = 50)	54,376 ± 2,288 (n = 20)	60,440 ± 3,691 (n = 50)	56,308 ± 3,337 (n = 20)	40,428 ± 2,445 (n = 40)	45,522 ± 2,391 (n = 20)
Sulfate	8,914 ± 659[a] (n = 50)	6,393 ± 335[a] (n = 20)	7,550 ± 623[a] (n = 50)	5,044 ± 312[a] (n = 20)	11,200 ± 1,072 (n = 40)	8,517 ± 604 (n = 20)
Nitrate (as N)	335 ± 49[a] (n = 45)	114 ± 11[a] (n = 20)	386 ± 55[a] (n = 45)	129 ± 14[a] (n = 20)	372 ± 54 (n = 33)	246 ± 35 (n = 20)
Phosphate (as P)	1,324 ± 183 (n = 50)	1,215 ± 60 (n = 20)	979 ± 43 (n = 50)	1,000 ± 39 (n = 20)	1,437 ± 74 (n = 40)	1,522 ± 54 (n = 20)
Fluoride	5.8 ± 0.7[a] (n = 40)	9.0 ± 0[a]* (n = 20)	6.3 ± 0.7[a] (n = 40)	10.2 ± 0.3[a] (n = 20)	8.4 ± 0.6 (n = 30)	9.0 ± 0* (n = 20)

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

*Difference statistics may be biased because sample means were not based on a normal distribution.

Table 9-21. Species composition cover (%), and diversity of flora in three salt-bush (<u>Atriplex</u> sp.) communities during preoperational and 1986-1987 periods at PVNGS monitoring sites (sheet 1 of 2)

	Parameter	Site 2		Site 3		Site 44	
		Preop	Op	Preop	Op	Preop	Op
	Species composition and percent cover						
	SHRUBS						
Atriplex polycarpa	Salt-bush, orache	18.9	22.0	20.0	22.8	13.1	8.0
Atriplex linearis	Salt-bush, orache	0.5	0.3	1.5	0.8	0.4	
Prosopis velutina	Mesquite	3.9	5.7				
Larrea divaricata	Creosote-bush	4.9	5.3			0.8	0.6
Lycium Fremontii	Wolf-berry	0.1		1.3	0.4		
Lycium sp.	Wolf-berry	0.3	0.2	5.4	2.6		
	HERBS						
Abronia villosa	Sand-verbena	<0.1					
Allionia incarnata	None	<0.1					
Amaranthus fimbriatus	Amaranth, pig-weed	0.1		<0.1			
Ambrosia dumosa	Ragweed			0.1	<0.1		
Amsinckia intermedia	Fiddle-neck	0.1	0.2	<0.1		<0.1	<0.1
Brassica Tourneforti	None						<0.1
Chaenactis carphoclinia	None	<0.1					
Cryptantha augustifolia	None			<0.1			
Cryptantha inaequata	None				<0.1		
Eriastrum diffusum	None			<0.1	<0.1		
Erigeron lobatus	Fleabane, wild-daisy		<0.1				
Eriogonum Thomasii	Wild-buckwheat	<0.1					
Eriophyllum lanosum	Wooly-daisy	0.2		<0.1			
Erodium cicutarium	Heron-bill				<0.1		
Eucrypta micrantha	None					<0.1	
Euphorbia capitellata	Spurge	<0.1					
Euphorbia sp.	Spurge	<0.1		0.3		6.2	
Lepidium lasiocarpum	Pepper-grass	<0.1	<0.1	0.1	<0.1	<0.1	
Lepidium virginicum	Pepper-grass	<0.1		<0.1		<0.1	

Table 9-21. Species composition cover (%) [illegible] diversity of flora in three salt-bush (Atriplex sp.) communities during preoperational and 1986-1987 periods at PVNGS monitoring sites (sheet 2 of 2)

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)							
Lepidium sp.	Pepper-grass		<0.1		<0.1		
Lesquerella Gordoni	Bladder-pod	<0.1					
Machaeranthera arida	None	<0.1	<0.1	<0.1	<0.1		
Monoptilon bellioides	None		<0.1		<0.1		
Nama hispidum	None			<0.1			
Oligomeris linifolia	None	<0.1		<0.1			
Orthocarpus purpurascens	Owl-clover	<0.1		<0.1		<0.1	
Pectis papposa	Fetid-marigold, chinchweed	0.1		<0.1		0.3	<0.1
Pectocarya platycarpa	None			<0.1			
Plantago insularis	Plaintain, Indian-wheat	1.1	1.4	0.3	0.1	2.5	0.6
Proboscidia altheaefolia	Unicorn-plant	0.1					
Sphaeralcea Coulteri	Globe-mallow	1.8	<0.1	<0.1		7.2	0.1
Tidestromia lanuginosa	None					<0.1	
Trianthema Portulacastrum	Pigweed	<0.1					
GRASSES							
Bouteloua barbata	Gamma	0.3		0.9			
Festuca octoflora	Fescue	<0.1		0.1			
Schismus arabicus	None						0.5
Schismus barbatus	None	2.1	<0.1	6.8	<0.1	7.2	
Schismus sp.	None		9.1		9.8		15.7
Diversity and plot size							
Species richness		29	15	22	15	14	9
Heterogeneity (H')		.67	.61	.62	.43	.72	.41
Index of similarity (%)		50		54		48	
Number of plots		50	40	50	40	50	40

Table 9-22. Electrical conductivity and concentrations of soluble ions in soils at PVNGS agricultural monitoring sites, preoperational period and 1987 (means ± standard errors)

Parameter	Preoperational* (n = 404)	1987 (n = 156)
Electrical conductivity (mmhos/cm)	1.40 ± 0.06	1.52 ± 0.09
Soluble ions (ppm)		
Calcium	48 ± 3	52 ± 5
Magnesium	7.0 ± 0.4	7.1 ± 0.6
Sodium	266 ± 10	281 ± 15
Potassium†	26 ± 1	19 ± 1
Chloride†	173 ± 12	221 ± 20

*May 1983 through December 1985.

†Means for preoperational period and 1987 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 1987 (means ± standard errors)

Site†	Electrical conductivity (mmhos/cm)		Soluble calcium (ppm)		Soluble magnesium (ppm)	
	Preoperational*	1987	Preoperational*	1987	Preoperational*	1987
7	1.17 ± 0.14[a]	0.80 ± 0.07[a]	31 ± 2[a]	23 ± 2[a]	6.0 ± 0.5[a]	4.2 ± 0.4[a]
11	1.35 ± 0.12	1.74 ± 0.37	44 ± 4	83 ± 33	3.7 ± 0.3	6.7 ± 2.5
12	1.89 ± 0.20	2.29 ± 0.20	63 ± 8	84 ± 13	9.6 ± 1.4	9.4 ± 1.5
13	0.96 ± 0.07	1.31 ± 0.30	21 ± 2[a]	51 ± 12[a]	2.8 ± 0.2[a]	6.8 ± 1.4[a]
23	1.27 ± 0.12[a]	0.76 ± 0.03[a]	56 ± 7[a]	36 ± 1[a]	6.2 ± 0.7[a]	3.7 ± 0.3[a]
24	0.89 ± 0.04	1.26 ± 0.20	31 ± 2	45 ± 9	4.0 ± 0.4[a]	6.0 ± 1.0[a]
25	0.98 ± 0.07	1.23 ± 0.25	66 ± 8	96 ± 20	9.0 ± 0.8	15 ± 3
28	0.71 ± 0.04[a]	0.53 ± 0.02[a]	20 ± 2[a]	30 ± 3[a]	2.3 ± 0.3	4.5 ± 1.3
30	3.82 ± 0.30	3.42 ± 0.56	157 ± 17	109 ± 29	22 ± 2	15 ± 4
31	0.87 ± 0.05[a]	1.29 ± 0.18[a]	19 ± 2	24 ± 1	3.9 ± 0.9	4.1 ± 0.9
32	1.26 ± 0.09[a]	1.82 ± 0.17[a]	26 ± 7	23 ± 1	2.8 ± 0.4	2.9 ± 0.5
43	1.65 ± 0.22	1.39 ± 0.11	66 ± 9	49 ± 3	14 ± 2	11 ± 1
45	1.31 ± 0.11[a]	1.98 ± 0.23[a]	17 ± 2	20 ± 1	3.3 ± 0.7	2.3 ± 0.2

Site†	Soluble sodium (ppm)		Soluble potassium (ppm)		Chloride (ppm)	
	Preoperational*	1987	Preoperational*	1987	Preoperational*	1987
7	231 ± 30	167 ± 21	11 ± 1	9.2 ± 0.7	103 ± 28	64 ± 12
11	235 ± 19	311 ± 47	32 ± 3	26 ± 3	153 ± 21	275 ± 87
12	361 ± 43	347 ± 27	80 ± 8	68 ± 5	299 ± 46	394 ± 56
13	197 ± 21	230 ± 49	17 ± 1	19 ± 3	120 ± 16	228 ± 81
23	254 ± 26[a]	154 ± 8[a]	18 ± 1[a]	7.9 ± 0.4[a]	153 ± 28[a]	62 ± 4[a]
24	166 ± 9	209 ± 25	34 ± 2	30 ± 4	65 ± 8	141 ± 35
25	124 ± 9	153 ± 33	28 ± 2	21 ± 3	59 ± 9	112 ± 28
28	148 ± 8[a]	117 ± 6[a]	9.4 ± 0.7	8.9 ± 0.7	35 ± 4	30 ± 5
30	694 ± 51	604 ± 75	52 ± 5[a]	27 ± 4[a]	696 ± 63	636 ± 131
31	189 ± 11[a]	292 ± 36[a]	7.9 ± 0.6	7.5 ± 1.3	79 ± 11	174 ± 48
32	294 ± 24[a]	391 ± 41[a]	4.3 ± 0.4[a]	7.3 ± 0.9[a]	124 ± 17[a]	272 ± 39[a]
43	289 ± 35	246 ± 24	28 ± 3[a]	15 ± 2[a]	241 ± 38	229 ± 26
45	295 ± 23[a]	428 ± 51[a]	6.8 ± 1.6	4.7 ± 0.4	99 ± 19[a]	260 ± 46[a]

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

*May 1983 through December 1985.

†Sample size was 12 for each site in 1987; 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 1987 (means ± standard errors)

Parameter	Preoperational (n = 576)	1987 (n = 232)
Electrical conductivity (mmhos/cm)*	0.59 ± 0.03	0.70 ± 0.05
Soluble ions (ppm)		
Calcium	44 ± 2	51 ± 4
Magnesium	5.1 ± 0.3	5.8 ± 0.3
Sodium*	70 ± 5	94 ± 9
Potassium	22 ± 1	22 ± 2
Chloride*	50 ± 6	89 ± 12

*For this parameter, means for preoperational period and 1987 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 1987 (means + standard errors) (sheet 1 of 2)

Site	Electrical conductivity (mmhos/cm) Preoperational	Electrical conductivity (mmhos/cm) 1987	Soluble calcium (ppm) Preoperational	Soluble calcium (ppm) 1987	Soluble magnesium (ppm) Preoperational	Soluble magnesium (ppm) 1987
1	1.05 ± 0.16	1.78 ± 0.50	110 ± 18	221 ± 77	8.1 ± 1.0	13 ± 4
2	0.78 ± 0.22	0.63 ± 0.14	35 ± 6	28 ± 2	10 ± 5	5.2 ± 0.3
3	5.57 ± 1.15	6.46 ± 1.15	45 ± 8	37 ± 7	18 ± 6	6.1 ± 1.7
4	0.35 ± 0.02[a]	0.30 ± 0.01[a]	50 ± 3	56 ± 3	4.2 ± 0.3	4.6 ± 0.2
5	0.58 ± 0.03	0.58 ± 0.03	21 ± 2[a]	29 ± 1[a]	3.2 ± 0.3[a]	4.8 ± 0.6[a]
6	0.35 ± 0.02	0.32 ± 0.02	35 ± 3	38 ± 3	3.3 ± 0.3	2.6 ± 0.2
8	0.91 ± 0.17	1.61 ± 0.34	21 ± 2	19 ± 1	3.5 ± 0.3	2.6 ± 0.4
9	0.50 ± 0.04	0.46 ± 0.06	53 ± 6[a]	38 ± 3[a]	7.3 ± 0.4[a]	6.2 ± 0.2[a]
10	0.40 ± 0.03	0.34 ± 0.02	45 ± 6	42 ± 2	6.1 ± 0.6[a]	4.8 ± 0.2[a]
14	1.21 ± 0.31	0.90 ± 0.07	45 ± 6	46 ± 3	7.0 ± 0.5	7.5 ± 0.5
15	0.38 ± 0.02[a]	0.26 ± 0.06[a]	55 ± 5	48 ± 2	4.4 ± 0.3	4.0 ± 0.0*
16	4.80 ± 1.12	6.64 ± 1.26	29 ± 3	34 ± 3	4.6 ± 0.5	5.2 ± 1.0
17	0.49 ± 0.05[a]	0.73 ± 0.07[a]	54 ± 5[a]	84 ± 7[a]	7.6 ± 1.6[a]	14 ± 2[a]
18	0.33 ± 0.02[a]	0.25 ± 0.01[a]	48 ± 3	48 ± 1	4.2 ± 0.3	3.6 ± 0.2
19	0.42 ± 0.02	0.36 ± 0.02	37 ± 2	36 ± 3	4.2 ± 0.2	4.5 ± 0.3
20	0.47 ± 0.03	0.52 ± 0.03	33 ± 8	32 ± 3	13 ± 5	7.8 ± 1.4
21	0.58 ± 0.08	0.59 ± 0.10	20 ± 2	27 ± 3	4.3 ± 0.6	13 ± 4
22	0.27 ± 0.02[a]	0.22 ± 0.01[a]	41 ± 2	39 ± 1	3.2 ± 0.2	3.0 ± 0.0*
26	0.31 ± 0.02[a]	0.24 ± 0.01[a]	52 ± 7	43 ± 2	3.6 ± 0.2	3.2 ± 0.2
27	1.43 ± 0.27	0.92 ± 0.10	28 ± 3	26 ± 2	5.4 ± 1.2	6.6 ± 1.3
33	0.21 ± 0.02	0.21 ± 0.02	28 ± 2[a]	35 ± 1[a]	2.8 ± 0.2	3.0 ± 0.0*
34	0.31 ± 0.02[a]	0.24 ± 0.00[a]	45 ± 3	47 ± 2	3.6 ± 0.2[a]	3.1 ± 0.1[a]
35	0.21 ± 0.02	0.19 ± 0.01	31 ± 2[a]	40 ± 2[a]	2.8 ± 0.1	2.8 ± 0.2
36	0.57 ± 0.14[a]	1.49 ± 0.32[a]	53 ± 8[a]	124 ± 24[a]	4.4 ± 0.6[a]	9.6 ± 1.8[a]
37	0.31 ± 0.02	0.32 ± 0.03	56 ± 4	64 ± 6	3.8 ± 0.2	3.6 ± 0.3
38	0.58 ± 0.05	0.79 ± 0.13	15 ± 4	13 ± 1	2.8 ± 0.5	2.6 ± 0.3
39	1.68 ± 0.36	2.13 ± 0.50	69 ± 25	45 ± 10	8.0 ± 2.9	5.9 ± 1.5
40	0.37 ± 0.02[a]	1.03 ± 0.19[a]	56 ± 2[a]	89 ± 10[a]	4.5 ± 0.2[a]	13 ± 3[a]
41	1.00 ± 0.21	1.71 ± 0.47	43 ± 8	43 ± 8	4.4 ± 0.3	4.6 ± 0.8
42	0.29 ± 0.02	0.26 ± 0.02	46 ± 2	50 ± 2	3.3 ± 0.2	3.4 ± 0.2
44	0.65 ± 0.06	0.78 ± 0.14	44 ± 14	28 ± 1	4.9 ± 0.5	4.8 ± 0.2

Table 9-25. Electrical conductivity and ion content of soil at PVNGS native monitoring sites, preoperational period and 1987 (means + standard errors) (sheet 2 of 2)

Site	Soluble sodium (ppm)		Soluble potassium (ppm)		Chloride (ppm)	
	Preoperational	1987	Preoperational	1987	Preoperational	1987
1	91 ± 17	139 ± 33	12 ± 1	10 ± 1	108 ± 26[a]	230 ± 65[a]
2	92 ± 20	115 ± 34	23 ± 3	18 ± 2	44 ± 14	73 ± 26
3	1111 ± 167	1414 ± 296	32 ± 5	22 ± 2	1164 ± 210	1713 ± 326
4	10 ± 1	12 ± 1	16 ± 1	15 ± 1	8.6 ± 1.0[a]	13 ± 1[a]
5	104 ± 11	113 ± 10	15 ± 1	12 ± 2	21 ± 5	23 ± 2
6	40 ± 4	51 ± 8	4.4 ± 0.5	3.4 ± 0.6	12 ± 4	16 ± 1
8	174 ± 35	283 ± 61	26 ± 11	19 ± 3	148 ± 38	328 ± 81
9	35 ± 7	47 ± 11	40 ± 3	36 ± 3	31 ± 7	44 ± 16
10	30 ± 4	28 ± 5	14 ± 1[a]	9.2 ± 0.9[a]	15 ± 3	24 ± 4
14	63 ± 7	85 ± 11	93 ± 6	84 ± 13	38 ± 11	59 ± 13
15	9.6 ± 0.9	9.2 ± 0.8	25 ± 3	19 ± 3	12 ± 2	15 ± 2
16	1075 ± 192	1313 ± 348	59 ± 8	65 ± 7	1048 ± 205	1468 ± 296
17	11 ± 1	13 ± 1	50 ± 8[a]	92 ± 10[a]	12 ± 1	12 ± 1
18	13 ± 1	15 ± 1	9.6 ± 0.9[a]	4.6 ± 0.8[a]	11 ± 1[a]	16 ± 1[a]
19	23 ± 4	19 ± 2	53 ± 2	58 ± 5	12 ± 1[a]	18 ± 3[a]
20	86 ± 8	99 ± 14	33 ± 3	33 ± 3	9.3 ± 0.8[a]	24 ± 1[a]
21	102 ± 18	147 ± 34	20 ± 1	22 ± 3	52 ± 15	48 ± 12
22	8.1 ± 0.7	9.2 ± 0.7	9.2 ± 0.8[a]	6.2 ± 0.8[a]	9.4 ± 1.9	14 ± 1
26	16 ± 1	21 ± 3	8.4 ± 0.8[a]	4.1 ± 0.5[a]	10 ± 1[a]	19 ± 2[a]
27	317 ± 54	228 ± 24	15 ± 1	19 ± 4	148 ± 49	55 ± 16
33	8.9 ± 2.7	11 ± 1	10 ± 1	11 ± 1	12 ± 4[a]	20 ± 1[a]
34	12 ± 1	11 ± 1	7.1 ± 0.4	6.6 ± 0.4	9.2 ± 1.1[a]	14 ± 1[a]
35	7.1 ± 0.4	6.9 ± 0.8	11 ± 1	10 ± 2	7.2 ± 1.0[a]	12 ± 1[a]
36	56 ± 18[a]	162 ± 42[a]	11 ± 1	11 ± 1	54 ± 24[a]	256 ± 63[a]
37	7.9 ± 0.8	10 ± 1	6.5 ± 0.7	5.6 ± 0.6	9.8 ± 1.8[a]	32 ± 7[a]
38	137 ± 16	190 ± 31	3.3 ± 0.2	3.1 ± 0.3	33 ± 8[a]	66 ± 15[a]
39	304 ± 58	382 ± 103	9.8 ± 1.3	9.0 ± 1.0	370 ± 104	530 ± 174
40	12 ± 1[a]	124 ± 35[a]	24 ± 1	21 ± 2	12 ± 1[a]	94 ± 20[a]
41	179 ± 45	291 ± 99	12 ± 1	12 ± 2	177 ± 51	409 ± 142
42	11 ± 1[a]	15 ± 2[a]	7.4 ± 0.4	6.1 ± 1.0	8.8 ± 1.5[a]	20 ± 3[a]
44	74 ± 15	103 ± 30	76 ± 5	74 ± 8	44 ± 11	100 ± 31

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

*Difference statistics may be biased because sample means were not based on a normal distribution.

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. Sample size was 8 for each site in 1987; it was 20 for all sites except sites 16 (n = 12), 20 (n = 12), and 44 (n = 16) in preoperational period.

Table 9-26. Deposition, soil, and crop comparison, preoperational period and 1987

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

Key: NC, no significant change from preoperational period; F, fallow, no sample; D, decrease; I, increase; UC, crop changed, no comparison base.

*Difference statistics may be biased because more than 25 percent of analytical values were below detection limit.

†Change is from 1986 crop data.

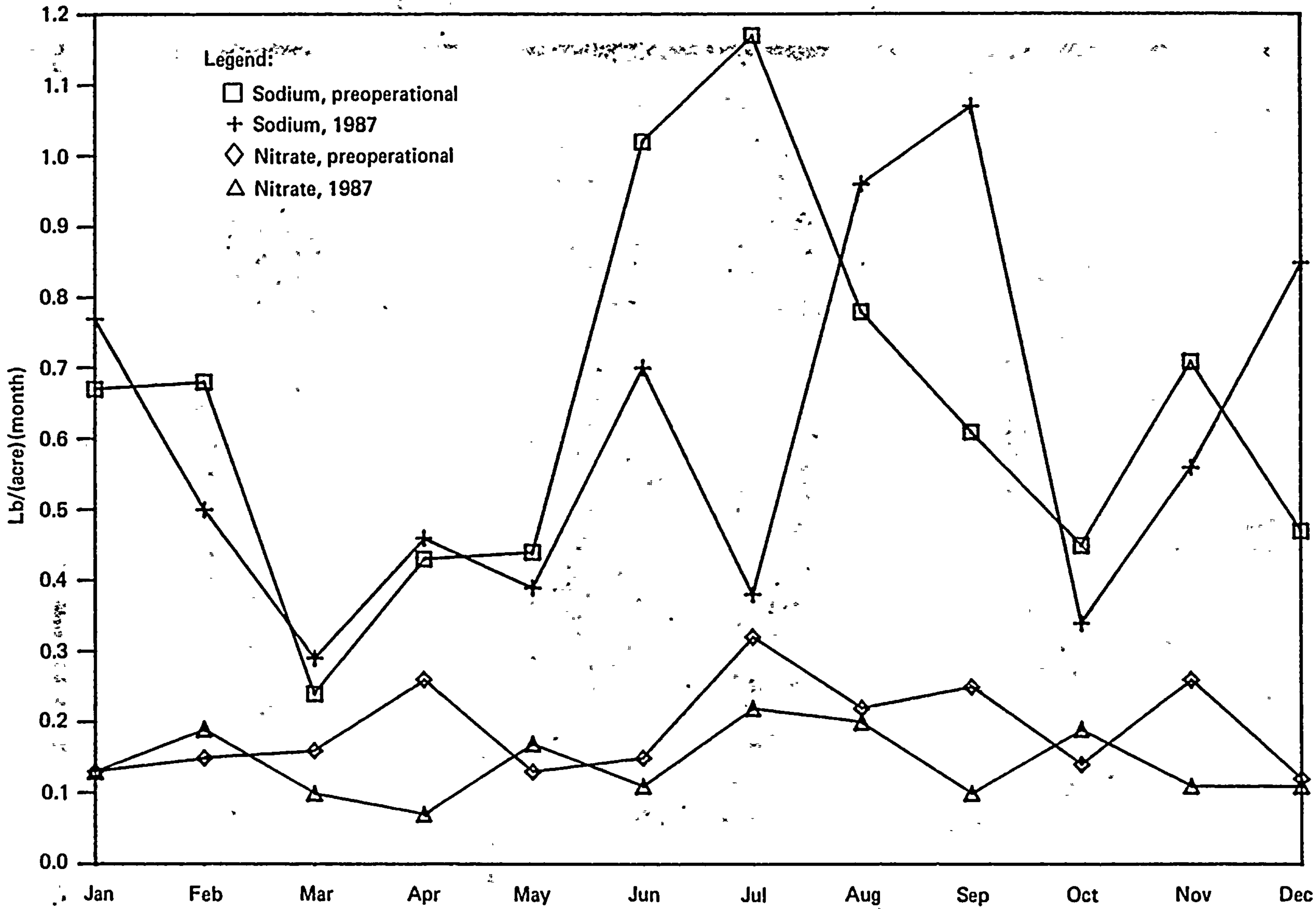


Figure 9-1. Mean monthly deposition of sodium and nitrate at PVNGS agricultural monitoring sites, preoperational period and 1987

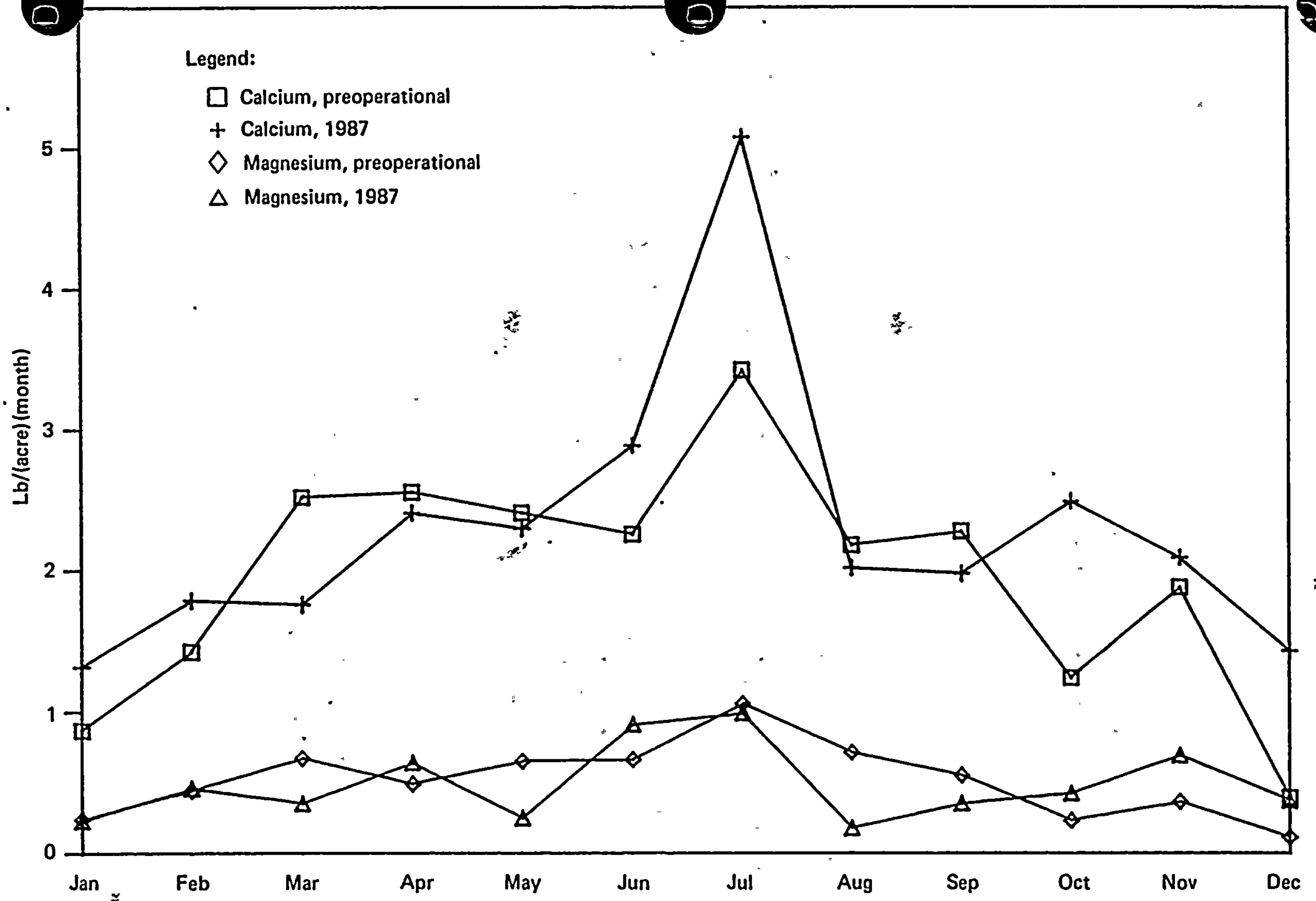


Figure 9-2. Mean monthly deposition of calcium and magnesium at PVNGS agricultural monitoring sites, preoperational period and 1987

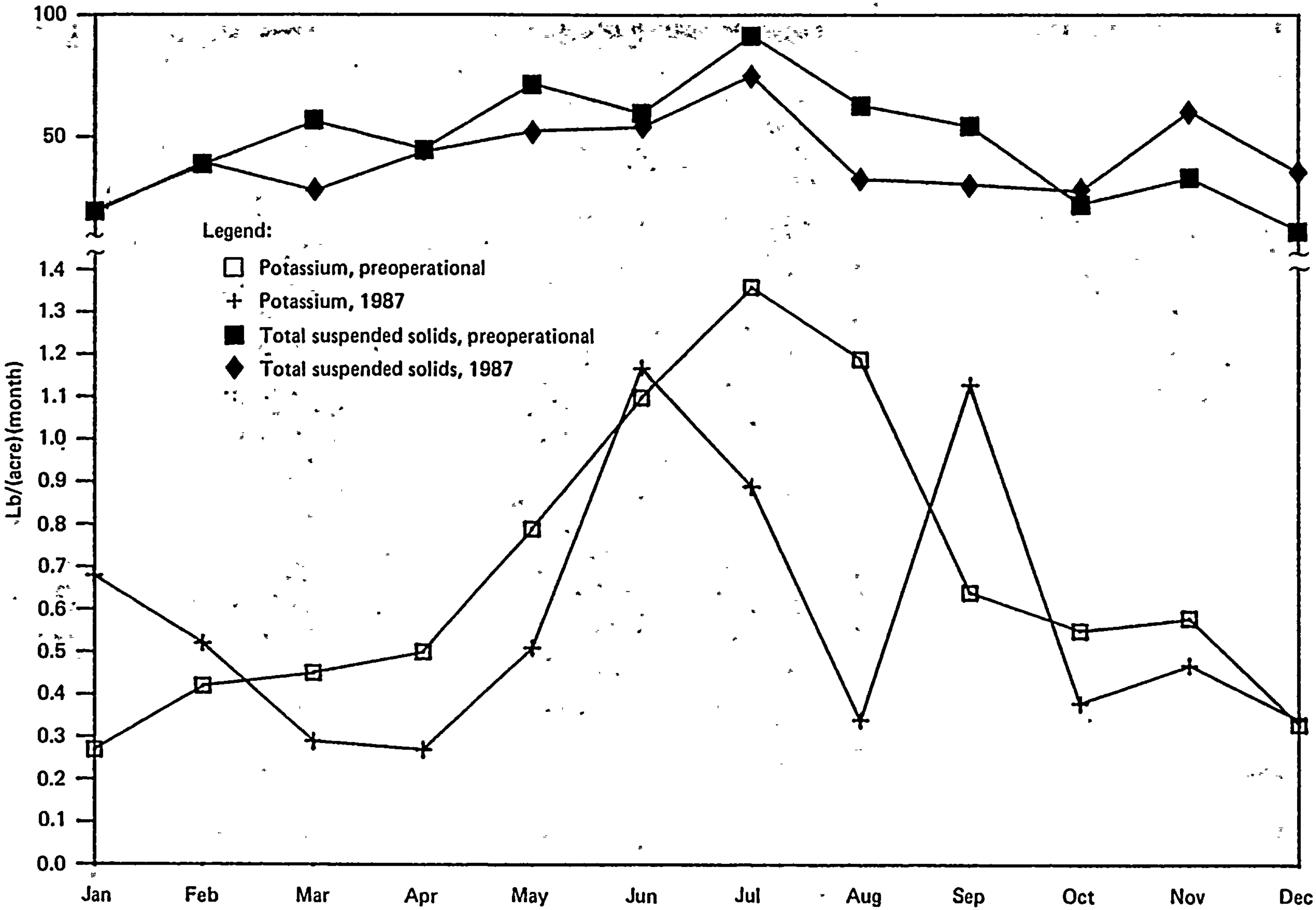


Figure 9-3. Mean monthly deposition of potassium and total suspended solids at PVNGS agricultural monitoring sites, preoperational period and 1987

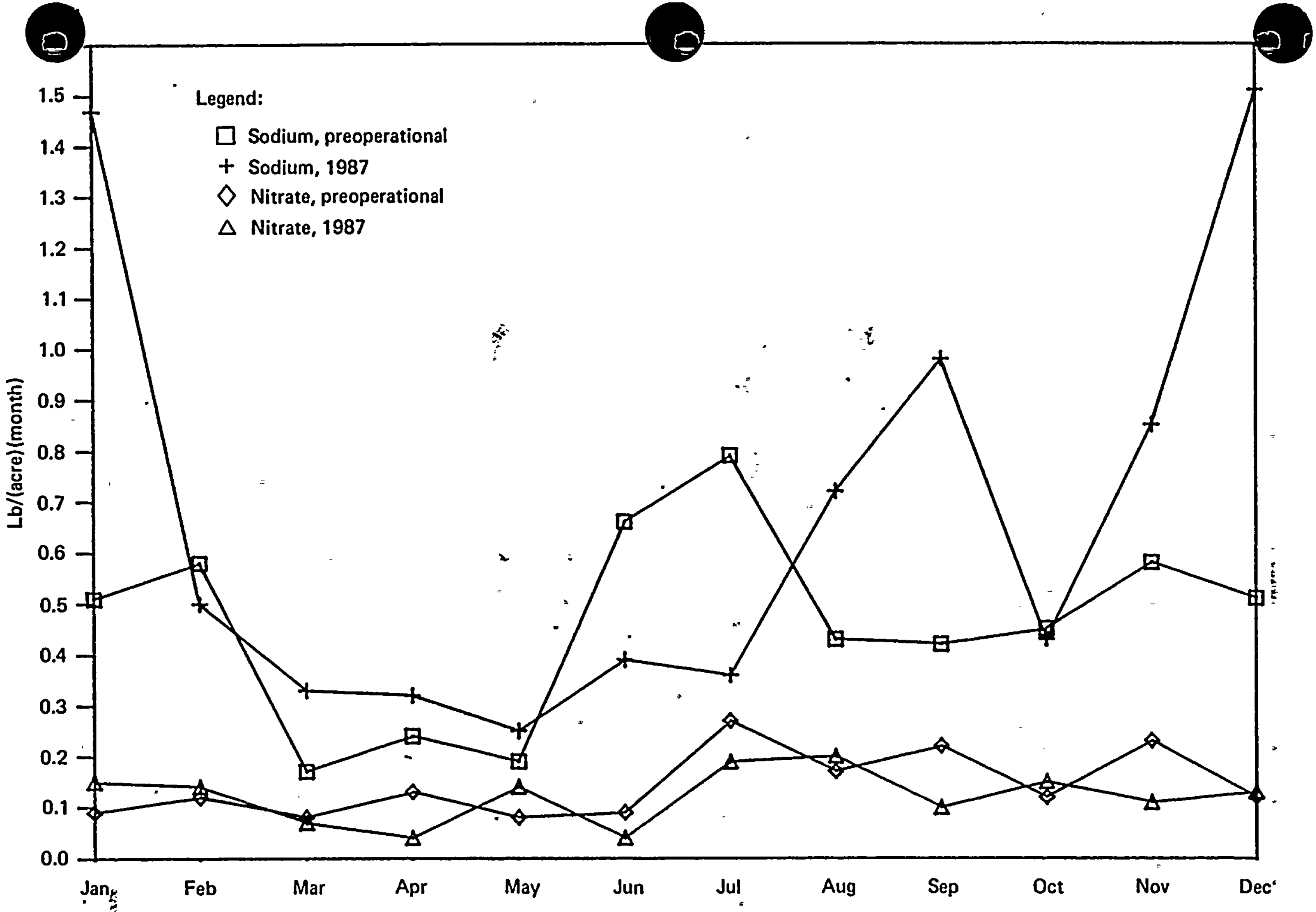


Figure 9-4. Mean monthly deposition of sodium and nitrate at PVNGS native monitoring sites (including sites 80-83), preoperational period and 1987

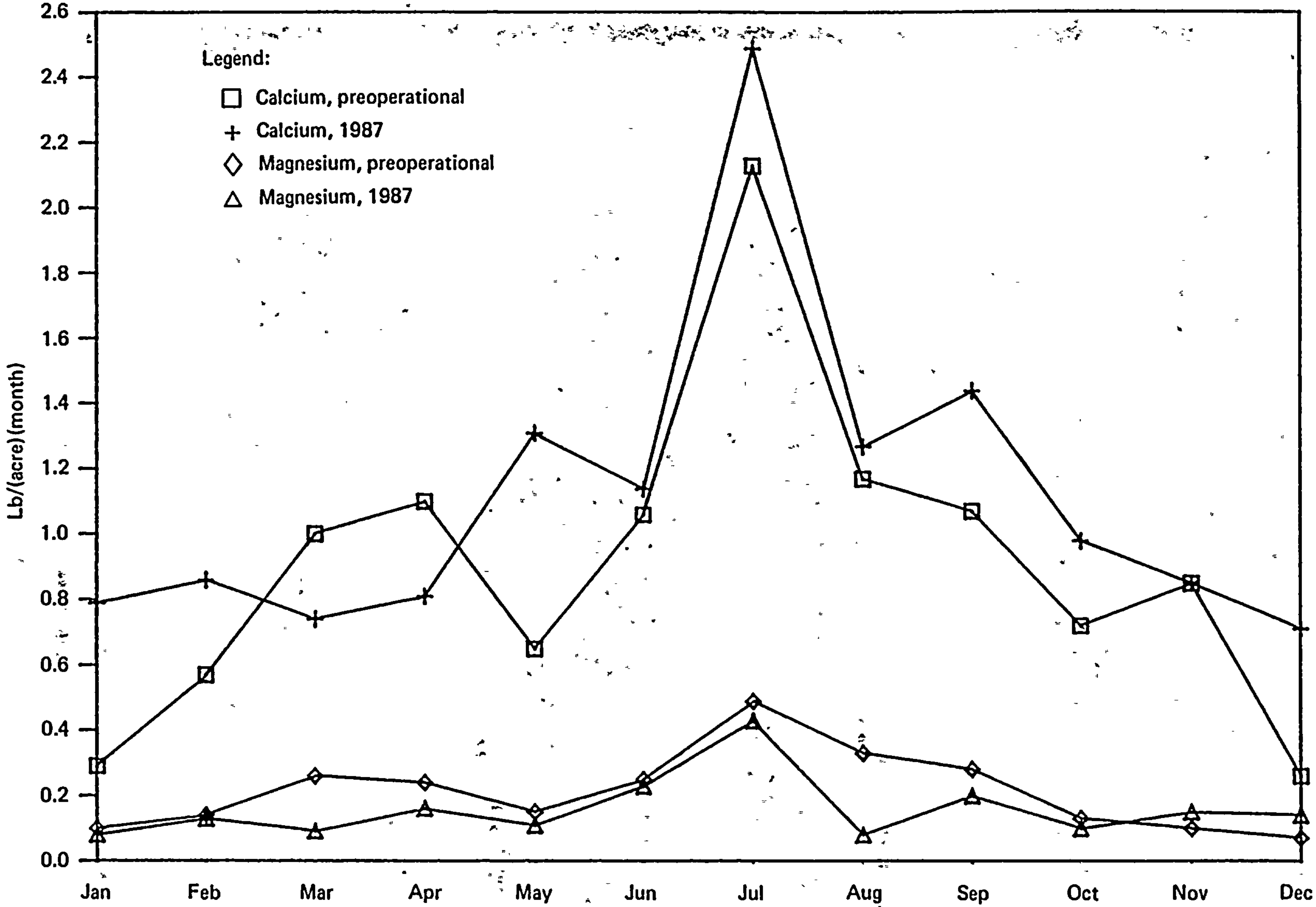


Figure 9-5. Mean monthly deposition of calcium and magnesium at PVNGS native monitoring sites (including sites 80-83), preoperational period and 1987

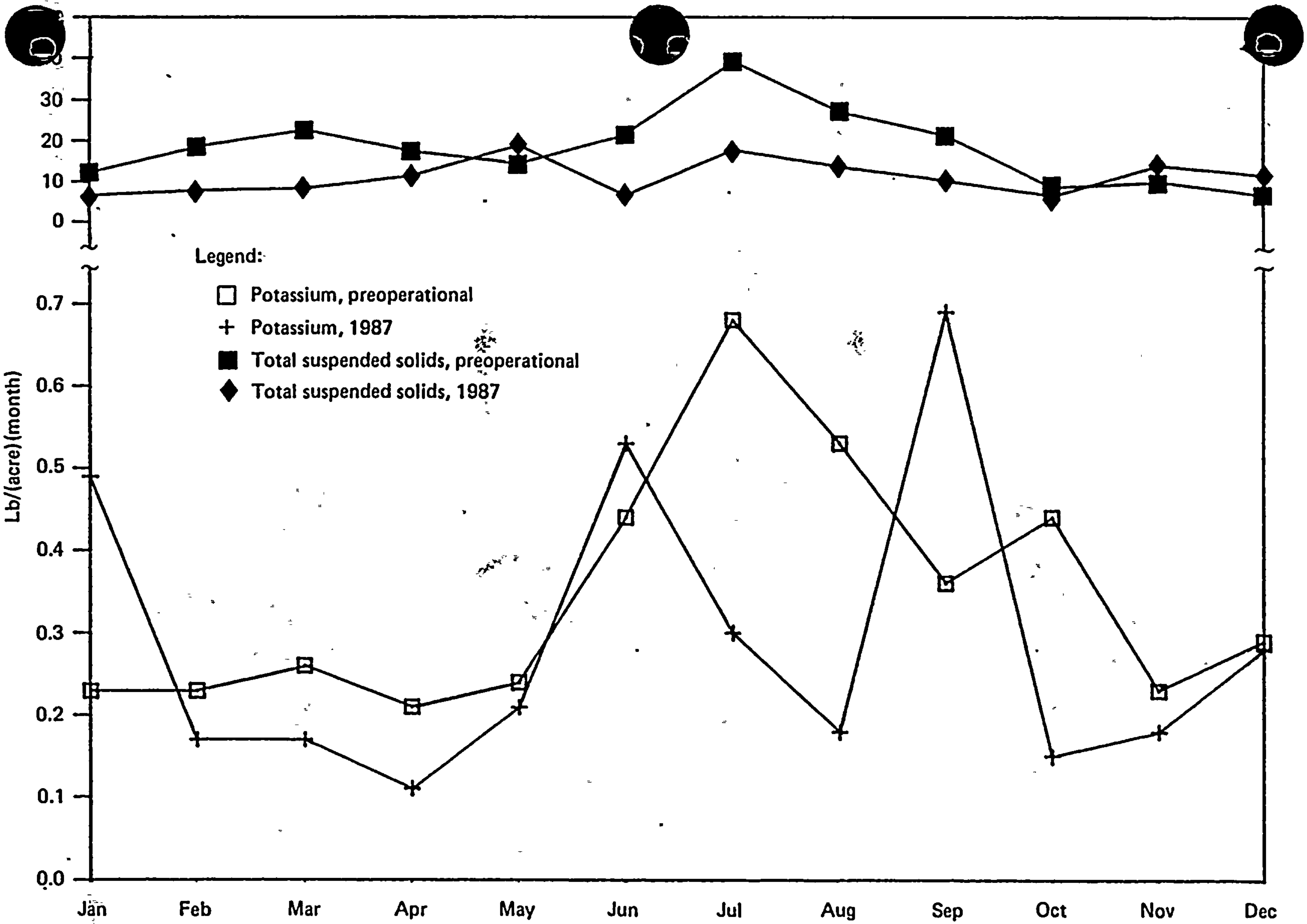


Figure 9-6. Mean monthly deposition of potassium and total suspended solids at PVNGS native monitoring sites (including sites 80-83), preoperational period and 1987

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APPENDIX A

PLANT OPERATING DATA

COOLING TOWER SOURCE TERM
FOR 1987
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	21200	90926.4	4	4	4	36	48	48
	2	22400	90835.2	4	4	4	36	48	48
	3	22600	90835.2	4	4	4	36	48	48
	4	21580	90926.4	4	4	4	36	48	48
	5	20300	90835.2	4	4	4	36	48	48
	6	23500	90835.2	4	4	4	36	48	48
	7	25200	90835.2	4	4	4	37	48	48
	8	22300	90926.4	4	4	4	42	48	48
	9	21500	90926.4	4	4	4	42	48	48
	10	20500	37027.2	4	4	4	33	40	40
	11	21600	2280.0	4	4	4	0	0	0
	12	22100	69950.4	4	4	4	28	32	32
	13	21600	90835.2	4	4	4	39	48	48
	14	22800	90835.2	4	4	4	39	48	48
	15	20500	90835.2	4	4	4	20	48	48
	16	24300	90835.2	4	4	4	20	48	48
	17	23560	90835.2	4	4	4	17	48	48
	18	20640	81259.2	4	4	3	10	40	40
	19	20900	0	2	2	1	0	0	0
	20	17890	0	0	2	1	0	0	0
	21	18200	0	0	0	0	0	0	0
	22	17940	0	0	0	0	0	0	0
	23	18070	0	0	0	0	0	0	0
	24	21800	0	0	0	0	0	0	2
	25	23300	0	0	0	0	0	0	3
	26	21700	0	0	0	0	0	0	1
	27	17800	0	0	0	0	0	0	0
	28	21000	0	0	0	0	0	0	0
	29	20500	0	0	0	0	0	0	0
	30	20600	0	0	0	0	0	0	0
	31	20450	0	0	0	0	0	0	0
AVERAGE		21236	47179.8	2	2	2	18	25	25

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

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 1987
CALCULATED TOWER PERFORMANCE PARAMETERS - UNIT 1

		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	7596	10128	10128	2.15E+08	15052	589000	1.080	0.136
	2	7596	10128	10128	2.15E+08	15904	589000	1.080	0.143
	3	7596	10128	10128	2.15E+08	16046	589000	1.080	0.145
	4	7596	10128	10128	2.15E+08	15322	589000	1.080	0.138
	5	7596	10128.	10128	2.15E+08	14413	589000	1.080	0.130
	6	7596	10128	10128	2.15E+08	16685	589000	1.080	0.150
	7	7807	10128	10128	2.15E+08	17892	589000	1.088	0.162
	8	8862	10128	10128	2.15E+08	15833	589000	1.129	0.149
	9	8862	10128	10128	2.15E+08	15265	589000	1.129	0.144
	10	6963	8440	8440	8.78E+07	14555	589000	0.924	0.112
	11	0	0	0	5.40E+06	15336	589000	0.000	0.000
	12	5908	6752	6752	1.66E+08	15691	589000	0.753	0.099
	13	8229	10128	10128	2.15E+08	15336	589000	1.104	0.141
	14	8229	10128	10128	2.15E+08	16188	589000	1.104	0.149
	15	4220	10128	10128	2.15E+08	14555	589000	0.949	0.115
	16	4220	10128	10128	2.15E+08	17253	589000	0.949	0.137
	17	3587	10128	10128	2.15E+08	16728	589000	0.924	0.129
	18	2110	8440	8440	1.93E+08	14654	542333	0.678	0.083
	19	0	0	0	0.00E+00	14839	262333	0.000	0.000
	20	0	0	0	0.00E+00	12702	169000	0.000	0.000
	21	0	0	0	0.00E+00	12922	29000	0.000	0.000
	22	0	0	0	0.00E+00	12737	29000	0.000	0.000
	23	0	0	0	0.00E+00	12830	29000	0.000	0.000
	24	0	0	422	0.00E+00	15478	29000	0.001	0.000
	25	0	0	633	0.00E+00	16543	29000	0.001	0.000
	26	0	0	211	0.00E+00	15407	29000	0.000	0.000
	27	0	0	0	0.00E+00	12638	29000	0.000	0.000
	28	0	0	0	0.00E+00	14910	29000	0.000	0.000
	29	0	0	0	0.00E+00	14555	29000	0.000	0.000
	30	0	0	0	0.00E+00	14626	29000	0.000	0.000
	31	0	0	0	0.00E+00	14520	29000	0.000	0.000
AVERAGE		3695.90	5336.26	5377.10	1.12E+08	15077.88	364699	0.555	0.073

MPTIONS: 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 1987
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	20300	0.0	0	0	0	0	0	0
2	20500	0.0	0	0	0	0	0	0
3	20500	0.0	0	0	0	0	0	0
4	20600	0.0	0	0	0	0	0	0
5	20800	0.0	0	0	0	0	0	0
6	14200	0.0	0	0	0	0	0	0
7	15500	0.0	0	0	0	0	0	0
8	11540	0.0	0	0	0	0	0	0
9	10720	0.0	0	0	0	0	0	0
10	12500	0.0	0	0	0	0	0	0
11	10610	0.0	0	0	0	0	0	0
12	10600	0.0	0	0	0	0	0	0
13	10420	0.0	0	0	0	0	0	0
14	12100	0.0	0	0	0	0	0	0
15	13200	0.0	0	0	0	0	0	0
16	11800	0.0	0	0	0	0	0	0
17	13200	0.0	0	0	0	0	0	0
18	13700	0.0	0	0	0	0	0	0
19	11790	0.0	0	0	0	0	0	0
20	12700	0.0	0	0	0	0	0	0
21	11200	0.0	0	0	0	0	0	0
22	11400	0.0	0	0	0	0	0	0
23	12020	0.0	0	0	0	0	0	0
24	11460	0.0	0	0	0	0	0	0
25	11680	0.0	0	0	0	0	0	0
26	11660	0.0	0	0	0	0	0	0
27	11300	0.0	0	0	0	0	0	0
28	10400	0.0	0	0	0	0	0	0
AVERAGE	13514	0.0	0	0	0	0	0	0

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 1987
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	14413	29000	0.000	0.000
2	0	0	0	0.00E+00	14555	29000	0.000	0.000
3	0	0	0	0.00E+00	14555	29000	0.000	0.000
4	0	0	0	0.00E+00	14626	29000	0.000	0.000
5	0	0	0	0.00E+00	14768	29000	0.000	0.000
6	0	0	0	0.00E+00	10082	29000	0.000	0.000
7	0	0	0	0.00E+00	11005	29000	0.000	0.000
8	0	0	0	0.00E+00	8193	29000	0.000	0.000
9	0	0	0	0.00E+00	7611	29000	0.000	0.000
10	0	0	0	0.00E+00	8875	29000	0.000	0.000
11	0	0	0	0.00E+00	7533	29000	0.000	0.000
12	0	0	0	0.00E+00	7526	29000	0.000	0.000
13	0	0	0	0.00E+00	7398	29000	0.000	0.000
14	0	0	0	0.00E+00	8591	29000	0.000	0.000
15	0	0	0	0.00E+00	9372	29000	0.000	0.000
16	0	0	0	0.00E+00	8378	29000	0.000	0.000
17	0	0	0	0.00E+00	9372	29000	0.000	0.000
18	0	0	0	0.00E+00	9727	29000	0.000	0.000
19	0	0	0	0.00E+00	8371	29000	0.000	0.000
20	0	0	0	0.00E+00	9017	29000	0.000	0.000
21	0	0	0	0.00E+00	7952	29000	0.000	0.000
22	0	0	0	0.00E+00	8094	29000	0.000	0.000
23	0	0	0	0.00E+00	8534	29000	0.000	0.000
24	0	0	0	0.00E+00	8137	29000	0.000	0.000
25	0	0	0	0.00E+00	8293	29000	0.000	0.000
26	0	0	0	0.00E+00	8279	29000	0.000	0.000
27	0	0	0	0.00E+00	8023	29000	0.000	0.000
28	0	0	0	0.00E+00	7384	29000	0.000	0.000
AVERAGE	0.00	0.00	0.00	0.00E+00	9595	29000	0.000	0.000

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 1987
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	10500	0.0	0	0	2	0	0	0
	2	10600	0.0	4	4	4	0	0	0
	3	10300	0.0	4	4	4	0	0	0
	4	8040	2280.0	4	4	4	0	0	0
	5	10500	4468.8	4	4	4	17	8	7
	6	9930	19881.6	4	4	4	36	16	14
	7	10880	59188.8	4	4	3	47	32	22
	8	12780	36753.6	2	2	2	45	44	2
	9	15960	37574.4	2	2	3	45	48	0
	10	14320	51984.0	4	4	3	42	44	15
	11	16370	26721.6	2	2	2	18	19	0
	12	17320	35932.8	2	4	3	18	48	6
	13	17800	40219.2	2	2	3	16	31	33
	14	18150	54172.8	4	4	4	44	8	30
	15	25000	74692.8	4	4	4	45	48	33
	16	27800	86184.0	4	4	4	45	48	33
	17	29300	89923.2	4	4	4	45	48	33
	18	24900	89284.8	4	4	4	45	48	33
	19	26900	88281.6	4	4	4	45	48	31
	20	25800	90744.0	4	4	4	45	48	30
	21	25600	90835.2	4	4	4	45	48	30
	22	25900	90835.2	4	4	4	45	48	30
	23	29000	83630.4	4	4	4	45	48	27
	24	29600	76425.6	4	4	4	45	48	23
	25	22000	89649.6	4	4	4	45	48	30
	26	19300	89649.6	4	4	4	45	48	30
	27	20000	89102.4	4	4	4	45	48	37
	28	24700	90835.2	4	4	4	45	48	33
	29	26400	90835.2	4	4	4	45	48	33
	30	25600	90835.2	4	4	4	44	48	33
	31	24500	90835.2	4	4	4	40	48	33
AVERAGE		19863	60056.7	4	4	4	35	36	21

ASSUMPTIONS: Drift Rate = 0.0002%
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 1987
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	7350	122333	0.000	0.000
	2	0	0	0	0.00E+00	7420	589000	0.000	0.000
	3	0	0	0	0.00E+00	7210	589000	0.000	0.000
	4	0	0	0	5.40E+06	5628	589000	0.000	0.000
	5	3587	1688	1477	1.06E+07	7350	589000	0.262	0.016
	6	7596	3376	2954	4.71E+07	6951	589000	0.540	0.031
	7	9917	6752	4642	1.40E+08	7616	542333	0.761	0.048
	8	9495	9284	422	8.71E+07	8946	309000	0.391	0.029
	9	9495	10128	0	8.91E+07	11172	355667	0.459	0.043
	10	8862	9284	3165	1.23E+08	10024	542333	0.761	0.064
	11	3798	4009	0	6.33E+07	11459	309000	0.159	0.015
	12	3798	10128	1266	8.52E+07	12124	449000	0.449	0.045
	13	3376	6541	6963	9.53E+07	12460	355667	0.395	0.041
	14	9284	1688	6330	1.28E+08	12705	589000	0.671	0.071
	15	9495	10128	6963	1.77E+08	17500	589000	1.031	0.151
	16	9495	10128	6963	2.04E+08	19460	589000	1.031	0.167
	17	9495	10128	6963	2.13E+08	20510	589000	1.031	0.176
	18	9495	10128	6963	2.12E+08	17430	589000	1.031	0.150
	19	9495	10128	6541	2.09E+08	18830	589000	1.014	0.159
	20	9495	10128	6330	2.15E+08	18060	589000	1.006	0.152
	21	9495	10128	6330	2.15E+08	17920	589000	1.006	0.150
	22	9495	10128	6330	2.15E+08	18130	589000	1.006	0.152
	23	9495	10128	5697	1.98E+08	20300	589000	0.982	0.166
	24	9495	10128	4853	1.81E+08	20720	589000	0.949	0.164
	25	9495	10128	6330	2.12E+08	15400	589000	1.006	0.129
	26	9495	10128	6330	2.12E+08	13510	589000	1.006	0.113
	27	9495	10128	7807	2.11E+08	14000	589000	1.063	0.124
	28	9495	10128	6963	2.15E+08	17290	589000	1.031	0.149
	29	9495	10128	6963	2.15E+08	18480	589000	1.031	0.159
	30	9284	10128	6963	2.15E+08	17920	589000	1.023	0.153
	31	8440	10128	6963	2.15E+08	17150	589000	0.990	0.142
AVERAGE		7398.61	7582.39	4499.06	1.42E+08	13904.03	533301	0.712	0.096

UMPTIONS: Drift Rate = 0.0002%
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 1987
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	23680	90835.2	4	4	4	42	48	33
	2	21700	90926.4	4	4	4	42	48	33
	3	24500	90835.2	4	4	4	44	48	33
	4	25500	90835.2	4	4	4	45	48	33
	5	25300	90835.2	4	4	4	45	48	33
	6	22760	90744.0	4	4	4	45	48	33
	7	24100	90926.4	4	4	4	45	48	35
	8	23660	90926.4	4	4	4	45	48	36
	9	25200	90926.4	4	4	4	45	48	34
	10	26100	90926.4	4	4	4	45	48	32
	11	26800	90926.4	4	4	4	45	48	39
	12	27000	90926.4	4	4	4	45	48	39
	13	27000	90835.2	4	4	4	45	48	39
	14	27600	90926.4	4	4	4	45	48	39
	15	31600	90835.2	4	4	4	45	48	40
	16	31400	90926.4	4	4	4	45	48	45
	17	29600	90835.2	4	4	4	45	48	45
	18	30300	90835.2	4	4	4	45	48	45
	19	29900	90926.4	4	4	4	45	48	45
	20	29900	90926.4	4	4	4	45	48	43
	21	31700	90835.2	4	4	4	45	48	33
	22	19800	90835.2	4	4	4	46	48	33
	23	18450	90835.2	4	4	4	48	48	34
	24	16210	88008.0	4	4	4	48	48	38
	25	15000	75787.2	3	3	4	48	48	45
	26	16500	87825.6	4	4	4	48	48	45
	27	24200	90926.4	4	4	4	48	48	45
	28	26500	90835.2	4	4	4	48	48	45
	29	17880	90835.2	4	4	4	48	48	45
	30	19250	90835.2	4	4	4	48	48	45
AVERAGE		24636	90172.5	4	4	4	46	48	39

ASSUMPTIONS: Drift Rate = 0.0002%
TDS ppm = 0.61 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 1987
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	8862	10128	6963	2.15E+08	14445	589000	1.006	0.121
	2	8862	10128	6963	2.15E+08	13237	589000	1.006	0.111
	3	9284	10128	6963	2.15E+08	14945	589000	1.023	0.128
	4	9495	10128	6963	2.15E+08	15555	589000	1.031	0.134
	5	9495	10128	6963	2.15E+08	15433	589000	1.031	0.133
	6	9495	10128	6963	2.15E+08	13884	589000	1.031	0.119
	7	9495	10128	7385	2.15E+08	14701	589000	1.047	0.128
	8	9495	10128	7596	2.15E+08	14433	589000	1.055	0.127
	9	9495	10128	7174	2.15E+08	15372	589000	1.039	0.133
	10	9495	10128	6752	2.15E+08	15921	589000	1.023	0.136
	11	9495	10128	8229	2.15E+08	16348	589000	1.080	0.147
	12	9495	10128	8229	2.15E+08	16470	589000	1.080	0.148
	13	9495	10128	8229	2.15E+08	16470	589000	1.080	0.148
	14	9495	10128	8229	2.15E+08	16836	589000	1.080	0.152
	15	9495	10128	8440	2.15E+08	19276	589000	1.088	0.175
	16	9495	10128	9495	2.15E+08	19154	589000	1.129	0.180
	17	9495	10128	9495	2.15E+08	18056	589000	1.129	0.170
	18	9495	10128	9495	2.15E+08	18483	589000	1.129	0.174
	19	9495	10128	9495	2.15E+08	18239	589000	1.129	0.172
	20	9495	10128	9073	2.15E+08	18239	589000	1.113	0.169
	21	9495	10128	6963	2.15E+08	19337	589000	1.031	0.166
	22	9706	10128	6963	2.15E+08	12078	589000	1.039	0.105
	23	10128	10128	7174	2.15E+08	11255	589000	1.063	0.100
	24	10128	10128	8018	2.09E+08	9888	589000	1.096	0.090
	25	10128	10128	9495	1.80E+08	9150	495667	0.971	0.074
	26	10128	10128	9495	2.08E+08	10065	589000	1.153	0.097
	27	10128	10128	9495	2.15E+08	14762	589000	1.153	0.142
	28	10128	10128	9495	2.15E+08	16165	589000	1.153	0.156
	29	10128	10128	9495	2.15E+08	10907	589000	1.153	0.105
	30	10128	10128	9495	2.15E+08	11743	589000	1.153	0.113
AVERAGE		9621.60	10128.00	8172.73	2.14E+08	15028.16	585889	1.076	0.135

ASSUMPTIONS: Drift Rate = 0.0002%
TDS ppm = 0.61 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 1987
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	19880	90744.0	4	4	4	48	48	44
	2	25900	90926.4	4	4	4	48	48	45
	3	25100	90835.2	4	4	4	48	48	45
	4	26400	90926.4	4	4	4	48	48	45
	5	24800	90926.4	4	4	4	48	48	45
	6	25200	90926.4	4	4	4	48	48	45
	7	25300	90926.4	4	4	4	48	48	45
	8	27500	90835.2	4	4	4	48	48	45
	9	27500	90835.2	4	4	4	48	48	45
	10	27100	90835.2	4	4	4	48	48	45
	11	24000	90835.2	4	4	4	48	48	45
	12	26000	90835.2	4	4	4	48	48	45
	13	23000	90835.2	4	4	4	48	48	45
	14	25700	90835.2	4	4	4	48	48	45
	15	24400	90835.2	4	4	4	48	47	45
	16	24700	90744.0	4	4	4	48	47	45
	17	22400	90835.2	4	4	4	48	48	45
	18	23700	90835.2	4	4	4	48	48	45
	19	25200	90835.2	4	4	4	48	48	45
	20	24700	90926.4	4	4	4	48	46	45
	21	23800	90835.2	4	4	4	48	48	45
	22	22800	87825.6	4	4	4	48	48	45
	23	24100	73051.2	4	3	4	48	48	45
	24	22300	79344.0	4	4	4	48	48	45
	25	23500	90744.0	4	4	4	48	48	45
	26	25000	90835.2	4	4	4	48	48	42
	27	23900	90835.2	4	4	4	48	48	42
	28	24300	90835.2	4	4	4	48	48	42
	29	23100	90835.2	4	4	4	48	48	42
	30	20600	11308.8	4	4	3	16	16	14
	31	22600	1641.6	2	4	3	0	8	0
AVERAGE		24338	84360.0	4	4	4	45	46	42

ASSUMPTIONS: Drift Rate = 0.0002%
TDS ppm = 0.63 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 1987
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	10128	10128	9284	2.15E+08	12524	589000	1.145	0.120
	2	10128	10128	9495	2.15E+08	16317	589000	1.153	0.157
	3	10128	10128	9495	2.15E+08	15813	589000	1.153	0.152
	4	10128	10128	9495	2.15E+08	16632	589000	1.153	0.160
	5	10128	10128	9495	2.15E+08	15624	589000	1.153	0.150
	6	10128	10128	9495	2.15E+08	15876	589000	1.153	0.153
	7	10128	10128	9495	2.15E+08	15939	589000	1.153	0.153
	8	10128	10128	9495	2.15E+08	17325	589000	1.153	0.167
	9	10128	10128	9495	2.15E+08	17325	589000	1.153	0.167
	10	10128	10128	9495	2.15E+08	17073	589000	1.153	0.164
	11	10128	10128	9495	2.15E+08	15120	589000	1.153	0.146
	12	10128	10128	9495	2.15E+08	16380	589000	1.153	0.158
	13	10128	10128	9495	2.15E+08	14490	589000	1.153	0.139
	14	10128	10128	9495	2.15E+08	16191	589000	1.153	0.156
	15	10128	9917	9495	2.15E+08	15372	589000	1.145	0.147
	16	10128	9917	9495	2.15E+08	15561	589000	1.145	0.149
	17	10128	10128	9495	2.15E+08	14112	589000	1.153	0.136
	18	10128	10128	9495	2.15E+08	14931	589000	1.153	0.144
	19	10128	10128	9495	2.15E+08	15876	589000	1.153	0.153
	20	10128	9706	9495	2.15E+08	15561	589000	1.137	0.148
	21	10128	10128	9495	2.15E+08	14994	589000	1.153	0.144
	22	10128	10128	9495	2.08E+08	14364	589000	1.153	0.138
	23	10128	10128	9495	1.73E+08	15183	542333	1.062	0.135
	24	10128	10128	9495	1.88E+08	14049	589000	1.153	0.135
	25	10128	10128	9495	2.15E+08	14805	589000	1.153	0.143
	26	10128	10128	8862	2.15E+08	15750	589000	1.129	0.148
	27	10128	10128	8862	2.15E+08	15057	589000	1.129	0.142
	28	10128	10128	8862	2.15E+08	15309	589000	1.129	0.144
	29	10128	10128	8862	2.15E+08	14553	589000	1.129	0.137
	30	3376	3376	2954	2.68E+07	12978	542333	0.346	0.038
	31	0	1688	0	3.89E+06	14238	449000	0.050	0.006
AVERAGE		9583.48	9610.71	8889.23	2.00E+08	15332.98	581473	1.084	0.140

MPTIONS: Drift Rate = 0.0002%
TDS ppm = 0.63 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 1987
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	22300	24441.6	2	2	2	8	48	0
	2	26000	48883.2	2	2	3	48	48	7
	3	24800	90105.6	4	4	4	48	48	42
	4	22400	91017.6	4	4	4	48	48	39
	5	24500	90926.4	4	4	4	48	48	39
	6	24500	90835.2	4	4	4	48	48	39
	7	22800	90926.4	4	4	4	48	48	39
	8	22090	90835.2	4	4	4	48	48	39
	9	26100	90926.4	4	4	4	48	48	39
	10	24300	90835.2	4	4	4	48	48	39
	11	27100	90835.2	4	4	4	48	48	39
	12	27200	90835.2	4	4	4	48	48	41
	13	26800	90835.2	4	4	4	48	48	42
	14	25700	90835.2	4	4	4	48	48	42
	15	25800	90926.4	4	4	4	48	48	42
	16	26250	90926.4	4	4	4	48	47	42
	17	26300	90926.4	4	4	4	48	47	42
	18	25800	90926.4	4	4	4	48	48	42
	19	28300	90835.2	4	4	4	48	48	42
	20	28300	90926.4	4	4	4	48	48	42
	21	24000	90744.0	4	4	4	48	48	42
	22	27500	90835.2	4	4	4	46	48	42
	23	28300	90926.4	4	4	4	48	47	42
	24	18100	90926.4	4	4	4	48	45	42
	25	29500	90835.2	4	4	4	48	44	42
	26	29700	87369.6	4	4	4	48	46	42
	27	29200	73780.8	4	4	4	48	48	42
	28	29500	64022.4	4	4	3	48	48	42
	29	28000	0.0	1	1	1	16	16	14
	30	23500	0.0	0	0	0	0	0	0
AVERAGE		25821	79599.4	4	4	4	44	45	36

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 1987
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	1688	10128	0	5.79E+07	16279	309000	0.240	0.033
	2	10128	10128	1477	1.16E+08	18980	355667	0.509	0.081
	3	10128	10128	8862	2.14E+08	18104	589000	1.129	0.171
	4	10128	10128	8229	2.16E+08	16352	589000	1.104	0.151
	5	10128	10128	8229	2.15E+08	17885	589000	1.104	0.165
	6	10128	10128	8229	2.15E+08	17885	589000	1.104	0.165
	7	10128	10128	8229	2.15E+08	16644	589000	1.104	0.153
	8	10128	10128	8229	2.15E+08	16126	589000	1.104	0.149
	9	10128	10128	8229	2.15E+08	19053	589000	1.104	0.176
	10	10128	10128	8229	2.15E+08	17739	589000	1.104	0.163
	11	10128	10128	8229	2.15E+08	19783	589000	1.104	0.182
	12	10128	10128	8651	2.15E+08	19856	589000	1.121	0.186
	13	10128	10128	8862	2.15E+08	19564	589000	1.129	0.184
	14	10128	10128	8862	2.15E+08	18761	589000	1.129	0.177
	15	10128	10128	8862	2.15E+08	18834	589000	1.129	0.177
	16	10128	9917	8862	2.15E+08	19163	589000	1.121	0.179
	17	10128	9917	8862	2.15E+08	19199	589000	1.121	0.180
	18	10128	10128	8862	2.15E+08	18834	589000	1.129	0.177
	19	10128	10128	8862	2.15E+08	20659	589000	1.129	0.195
	20	10128	10128	8862	2.15E+08	20659	589000	1.129	0.195
	21	10128	10128	8862	2.15E+08	17520	589000	1.129	0.165
	22	9706	10128	8862	2.15E+08	20075	589000	1.113	0.186
	23	10128	9917	8862	2.15E+08	20659	589000	1.121	0.193
	24	10128	9495	8862	2.15E+08	13213	589000	1.104	0.122
	25	10128	9284	8862	2.15E+08	21535	589000	1.096	0.197
	26	10128	9706	8862	2.07E+08	21681	589000	1.113	0.201
	27	10128	10128	8862	1.75E+08	21316	589000	1.129	0.201
	28	10128	10128	8862	1.52E+08	21535	542333	1.039	0.187
	29	3376	3376	2954	0.00E+00	20440	169000	0.108	0.018
	30	0	0	0	0.00E+00	17155	29000	0.000	0.000
AVERAGE		9269.93	9480.93	7652.27	1.89E+08	18849.57	537667	0.993	0.157

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 1987
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	24900	0	0	0	0	0	0	0
	2	27300	0	0	0	0	0	0	0
	3	23624	0	0	0	0	0	0	0
	4	24290	0	0	0	1	0	0	0
	5	23600	0	1	0	0	0	0	0
	6	23100	0	0	0	0	0	0	0
	7	24000	0	0	0	0	0	0	0
	8	20300	0	0	0	0	0	0	0
	9	18460	0	0	0	0	0	0	0
	10	18700	0	0	0	0	0	0	0
	11	19400	0	0	0	0	0	0	0
	12	19200	0	0	0	0	0	0	0
	13	22100	0	0	0	0	0	0	0
	14	18940	0	0	0	0	0	0	0
	15	18600	0	0	0	0	0	0	0
	16	18900	0	0	0	0	0	0	0
	17	19000	0	0	0	0	0	0	0
	18	18600	0	0	0	0	0	0	0
	19	18180	0	0	0	0	0	0	0
	20	21300	0	0	0	0	0	0	0
	21	17200	0	0	0	0	0	0	0
	22	17600	0	0	0	0	0	0	0
	23	21300	0	0	0	0	0	0	0
	24	21300	0	0	0	0	0	0	0
	25	17300	0	0	0	0	0	0	0
	26	16050	0	0	0	0	0	0	0
	27	14800	0	0	0	0	0	0	0
	28	15700	0	0	1	1	0	0	0
	29	16200	0	1	1	1	0	0	0
	30	17900	483.4	1	1	2	0	0	0
	31	24200	29457.6	2	4	4	0	25	37
AVERAGE		20066	965.8	0	0	0	0	1	1

ASSUMPTIONS: Drift Rate = 0.0002%
TDS ppm = 0.68 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 1987
CALCULATED TOWER PERFORMANCE PARAMETERS - UNIT 1

		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	16932	29000	0.000	0.000
	2	0	0	0	0.00E+00	18564	29000	0.000	0.000
	3	0	0	0	0.00E+00	16064	29000	0.000	0.000
	4	0	0	0	0.00E+00	16517	75667	0.000	0.000
	5	0	0	0	0.00E+00	16048	75667	0.000	0.000
	6	0	0	0	0.00E+00	15708	29000	0.000	0.000
	7	0	0	0	0.00E+00	16320	29000	0.000	0.000
	8	0	0	0	0.00E+00	13804	29000	0.000	0.000
	9	0	0	0	0.00E+00	12553	29000	0.000	0.000
	10	0	0	0	0.00E+00	12716	29000	0.000	0.000
	11	0	0	0	0.00E+00	13192	29000	0.000	0.000
	12	0	0	0	0.00E+00	13056	29000	0.000	0.000
	13	0	0	0	0.00E+00	15028	29000	0.000	0.000
	14	0	0	0	0.00E+00	12879	29000	0.000	0.000
	15	0	0	0	0.00E+00	12648	29000	0.000	0.000
	16	0	0	0	0.00E+00	12852	29000	0.000	0.000
	17	0	0	0	0.00E+00	12920	29000	0.000	0.000
	18	0	0	0	0.00E+00	12648	29000	0.000	0.000
	19	0	0	0	0.00E+00	12362	29000	0.000	0.000
	20	0	0	0	0.00E+00	14484	29000	0.000	0.000
	21	0	0	0	0.00E+00	11696	29000	0.000	0.000
	22	0	0	0	0.00E+00	11968	29000	0.000	0.000
	23	0	0	0	0.00E+00	14484	29000	0.000	0.000
	24	0	0	0	0.00E+00	14484	29000	0.000	0.000
	25	0	0	0	0.00E+00	11764	29000	0.000	0.000
	26	0	0	0	0.00E+00	10914	29000	0.000	0.000
	27	0	0	0	0.00E+00	10064	29000	0.000	0.000
	28	0	0	0	0.00E+00	10676	122333	0.000	0.000
	29	0	0	0	0.00E+00	11016	169000	0.000	0.000
	30	0	0	0	1.15E+06	12172	215667	0.000	0.000
	31	0	5275	7807	6.98E+07	16456	495667	0.427	0.059
AVERAGE		0.00	170.16	251.84	2.29E+06	13644.84	60613	0.014	0.002

MPTIONS: Drift Rate = 0.0002%
TDS ppm = 0.68 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 1987
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	20100	87278.4	4	4	4	47	47	47
	2	23600	90744.0	4	4	4	47	47	47
	3	23960	90926.4	4	4	4	47	47	47
	4	28500	90288.0	4	4	4	47	47	47
	5	28600	90926.4	4	4	4	47	47	47
	6	29000	90652.8	4	4	4	47	47	47
	7	28200	90835.2	4	4	4	47	47	47
	8	27920	90835.2	4	4	4	46	46	46
	9	28100	90835.2	4	4	4	46	46	46
	10	28900	89467.2	4	4	4	46	47	47
	11	27100	90561.6	4	4	4	47	46	47
	12	26100	91017.6	4	4	4	47	47	47
	13	26200	90926.4	4	4	4	47	47	47
	14	25100	90926.4	4	4	4	47	47	47
	15	23180	90926.4	4	4	4	47	47	47
	16	22600	91017.6	4	4	4	47	47	47
	17	29200	90926.4	4	4	4	47	48	48
	18	24400	90926.4	4	4	4	48	47	47
	19	27100	90926.4	4	4	4	47	48	48
	20	26900	90926.4	4	4	4	48	48	48
	21	25900	90926.4	4	4	4	48	48	48
	22	26400	91017.6	4	4	4	48	48	48
	23	25200	90926.4	4	4	4	48	48	48
	24	25500	90835.2	4	4	4	48	48	48
	25	25700	90926.4	4	4	4	48	48	48
	26	27200	90926.4	4	4	4	48	48	48
	27	25700	73963.2	4	4	4	48	48	24
	28	25700	0.0	3	2	1	0	0	0
	29	26100	0.0	0	0	0	0	0	0
	30	25800	0.0	0	0	0	0	0	0
	31	24400	0.0	0	3	3	8	8	8
AVERAGE		26076	78432.0	4	4	4	41	41	41

ASSUMPTIONS: Drift Rate = 0.0002%
TDS ppm = 1.00 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 1987
CALCULATED TOWER PERFORMANCE PARAMETERS - UNIT 1

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	9917	9917	9917	2.07E+08	20100	589000	1.153	0.193
	2	9917	9917	9917	2.15E+08	23600	589000	1.153	0.227
	3	9917	9917	9917	2.15E+08	23960	589000	1.153	0.231
	4	9917	9917	9917	2.14E+08	28500	589000	1.153	0.274
	5	9917	9917	9917	2.15E+08	28600	589000	1.153	0.275
	6	9917	9917	9917	2.15E+08	29000	589000	1.153	0.279
	7	9917	9917	9917	2.15E+08	28200	589000	1.153	0.271
	8	9706	9706	9706	2.15E+08	27920	589000	1.129	0.263
	9	9706	9706	9706	2.15E+08	28100	589000	1.129	0.265
	10	9706	9917	9917	2.12E+08	28900	589000	1.145	0.276
	11	9917	9706	9917	2.15E+08	27100	589000	1.145	0.259
	12	9917	9917	9917	2.16E+08	26100	589000	1.153	0.251
	13	9917	9917	9917	2.15E+08	26200	589000	1.153	0.252
	14	9917	9917	9917	2.15E+08	25100	589000	1.153	0.242
	15	9917	9917	9917	2.15E+08	23180	589000	1.153	0.223
	16	9917	9917	9917	2.16E+08	22600	589000	1.153	0.218
	17	9917	10128	10128	2.15E+08	29200	589000	1.170	0.285
	18	10128	9917	9917	2.15E+08	24400	589000	1.162	0.237
	19	9917	10128	10128	2.15E+08	27100	589000	1.170	0.265
	20	10128	10128	10128	2.15E+08	26900	589000	1.178	0.264
	21	10128	10128	10128	2.15E+08	25900	589000	1.178	0.255
	22	10128	10128	10128	2.16E+08	26400	589000	1.178	0.260
	23	10128	10128	10128	2.15E+08	25200	589000	1.178	0.248
	24	10128	10128	10128	2.15E+08	25500	589000	1.178	0.251
	25	10128	10128	10128	2.15E+08	25700	589000	1.178	0.253
	26	10128	10128	10128	2.15E+08	27200	589000	1.178	0.267
	27	10128	10128	5064	1.75E+08	25700	589000	0.982	0.211
	28	0	0	0	0.00E+00	25700	309000	0.000	0.000
	29	0	0	0	0.00E+00	26100	29000	0.000	0.000
	30	0	0	0	0.00E+00	25800	29000	0.000	0.000
	31	1688	1688	1688	0.00E+00	24400	309000	0.103	0.021
AVERAGE		8732.68	8739.48	8582.94	1.86E+08	26076.13	534806	1.007	0.220

UMPTIONS: Drift Rate = 0.0002%
TDS ppm = 1.00 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 1987
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	24500	10396.8	3	3	3	8	8	8
2	27600	62563.2	4	4	4	16	47	47
3	28800	91017.6	4	4	4	47	47	47
4	28700	90926.4	4	4	4	47	47	47
5	26100	90926.4	4	4	4	47	47	47
6	26000	91017.6	4	4	4	47	47	47
7	27300	90926.4	4	4	4	47	47	47
8	27600	90926.4	4	4	4	47	48	48
9	30200	90926.4	4	4	4	48	48	48
10	27100	90926.4	4	4	4	48	48	48
11	29500	90926.4	4	4	4	48	48	48
12	27300	90926.4	4	4	4	48	48	48
13	26700	90926.4	4	4	4	48	48	48
14	21600	90835.2	4	4	4	48	47	47
15	28100	90744.0	4	4	4	47	47	47
16	27300	90561.6	4	4	4	47	48	48
17	26800	90288.0	4	4	4	48	48	48
18	29000	89376.0	4	4	4	48	48	48
19	24700	86548.8	4	4	4	48	48	48
20	26700	85728.0	4	4	4	48	48	48
21	25000	84816.0	4	4	4	48	48	48
22	26600	84086.4	4	4	4	48	48	48
23	25200	82992.0	4	4	4	48	48	48
24	26000	81532.8	4	4	4	48	48	48
25	24400	80985.6	4	4	4	48	46	46
26	25400	80073.6	4	4	4	46	46	46
27	26000	78249.6	4	4	4	46	47	47
28	25000	78158.4	4	4	4	47	47	47
29	24200	77520.0	4	4	4	47	47	47
30	26400	76881.6	4	4	4	48	48	48
AVERAGE	26527	83423.7	4	4	4	45	46	46

ASSUMPTIONS: Drift Rate = 0.0002%
TDS ppm = 0.90 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 1987
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	1688	1688	1688	2.46E+07	22050	449000	0.150	0.028
2	3376	9917	9917	1.48E+08	24840	589000	0.900	0.187
3	9917	9917	9917	2.16E+08	25920	589000	1.153	0.249
4	9917	9917	9917	2.15E+08	25830	589000	1.153	0.249
5	9917	9917	9917	2.15E+08	23490	589000	1.153	0.226
6	9917	9917	9917	2.16E+08	23400	589000	1.153	0.225
7	9917	9917	9917	2.15E+08	24570	589000	1.153	0.237
8	9917	10128	10128	2.15E+08	24840	589000	1.170	0.242
9	10128	10128	10128	2.15E+08	27180	589000	1.178	0.267
10	10128	10128	10128	2.15E+08	24390	589000	1.178	0.240
11	10128	10128	10128	2.15E+08	26550	589000	1.178	0.261
12	10128	10128	10128	2.15E+08	24570	589000	1.178	0.242
13	10128	10128	10128	2.15E+08	24030	589000	1.178	0.236
14	10128	9917	9917	2.15E+08	19440	589000	1.162	0.188
15	9917	9917	9917	2.15E+08	25290	589000	1.153	0.243
16	9917	10128	10128	2.15E+08	24570	589000	1.170	0.240
17	10128	10128	10128	2.14E+08	24120	589000	1.178	0.237
18	10128	10128	10128	2.12E+08	26100	589000	1.178	0.257
19	10128	10128	10128	2.05E+08	22230	589000	1.178	0.219
20	10128	10128	10128	2.03E+08	24030	589000	1.178	0.236
21	10128	10128	10128	2.01E+08	22500	589000	1.178	0.221
22	10128	10128	10128	1.99E+08	23940	589000	1.178	0.235
23	10128	10128	10128	1.97E+08	22680	589000	1.178	0.223
24	10128	10128	10128	1.93E+08	23400	589000	1.178	0.230
25	10128	9706	9706	1.92E+08	21960	589000	1.145	0.210
26	9706	9706	9706	1.90E+08	22860	589000	1.129	0.215
27	9706	9917	9917	1.85E+08	23400	589000	1.145	0.224
28	9917	9917	9917	1.85E+08	22500	589000	1.153	0.217
29	9917	9917	9917	1.84E+08	21780	589000	1.153	0.210
30	10128	10128	10128	1.82E+08	23760	589000	1.178	0.234
AVERAGE	9523.13	9741.17	9741.17	1.98E+08	23874.00	584333	1.123	0.224

UMPTIONS: Drift Rate = 0.0002%
TDS ppm = 0.90 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 1987
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	26100	75878.4	4	4	4	48	48	45
	2	20800	68126.4	4	4	3	40	40	37
	3	26900	0.0	2	2	2	0	0	0
	4	23700	0.0	2	2	2	0	0	0
	5	23300	0.0	2	2	2	0	0	0
	6	24400	0.0	1	0	0	0	0	1
	7	24900	0.0	0	0	0	1	1	1
	8	24300	0.0	0	0	0	1	1	1
	9	22400	0.0	0	0	0	1	1	1
	10	25700	0.0	0	0	0	1	1	1
	11	24800	0.0	0	0	0	1	1	1
	12	26800	0.0	0	0	0	1	1	1
	13	25600	0.0	0	0	0	1	1	1
	14	26000	0.0	0	0	0	1	1	1
	15	24700	0.0	0	0	0	1	1	1
	16	25400	0.0	0	0	0	1	1	1
	17	24700	0.0	0	0	0	0	0	0
	18	24800	0.0	0	0	0	0	0	0
	19	25100	0.0	0	0	0	0	0	0
	20	25100	0.0	0	0	0	0	0	0
	21	23300	0.0	0	0	0	0	0	0
	22	23300	0.0	0	0	0	0	0	0
	23	27200	0.0	0	0	0	0	0	0
	24	26900	0.0	0	0	0	0	0	0
	25	27800	0.0	0	0	0	0	0	0
	26	25000	0.0	0	0	0	0	0	1
	27	25200	0.0	0	0	0	1	1	1
	28	26200	0.0	0	0	0	1	1	1
	29	25600	0.0	0	0	0	1	1	1
	30	24200	0.0	0	0	0	1	1	1
	31	25100	0.0	0	0	0	1	1	1
AVERAGE		25010	4645.3	0	0	0	3	3	3

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 1987
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	10128	10128	9495	1.80E+08	19053	589000	1.153	0.183
	2	8440	8440	7807	1.61E+08	15184	542333	0.881	0.112
	3	0	0	0	0.00E+00	19637	309000	0.000	0.000
	4	0	0	0	0.00E+00	17301	309000	0.000	0.000
	5	0	0	0	0.00E+00	17009	309000	0.000	0.000
	6	0	0	211	0.00E+00	17812	75667	0.001	0.000
	7	211	211	211	0.00E+00	18177	29000	0.001	0.000
	8	211	211	211	0.00E+00	17739	29000	0.001	0.000
	9	211	211	211	0.00E+00	16352	29000	0.001	0.000
	10	211	211	211	0.00E+00	18761	29000	0.001	0.000
	11	211	211	211	0.00E+00	18104	29000	0.001	0.000
	12	211	211	211	0.00E+00	19564	29000	0.001	0.000
	13	211	211	211	0.00E+00	18688	29000	0.001	0.000
	14	211	211	211	0.00E+00	18980	29000	0.001	0.000
	15	211	211	211	0.00E+00	18031	29000	0.001	0.000
	16	211	211	211	0.00E+00	18542	29000	0.001	0.000
	17	0	0	0	0.00E+00	18031	29000	0.000	0.000
	18	0	0	0	0.00E+00	18104	29000	0.000	0.000
	19	0	0	0	0.00E+00	18323	29000	0.000	0.000
	20	0	0	0	0.00E+00	18323	29000	0.000	0.000
	21	0	0	0	0.00E+00	17009	29000	0.000	0.000
	22	0	0	0	0.00E+00	17009	29000	0.000	0.000
	23	0	0	0	0.00E+00	19856	29000	0.000	0.000
	24	0	0	0	0.00E+00	19637	29000	0.000	0.000
	25	0	0	0	0.00E+00	20294	29000	0.000	0.000
	26	0	0	211	0.00E+00	18250	29000	0.000	0.000
	27	211	211	211	0.00E+00	18396	29000	0.001	0.000
	28	211	211	211	0.00E+00	19126	29000	0.001	0.000
	29	211	211	211	0.00E+00	18688	29000	0.001	0.000
	30	211	211	211	0.00E+00	17666	29000	0.001	0.000
	31	211	211	211	0.00E+00	18323	29000	0.001	0.000
AVERAGE		701.06	701.06	673.84	1.10E+07	18257.06	92226	0.066	0.010

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 1987
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	24600	0.0	0	0	0	1	1	1
2	21900	0.0	0	0	0	1	1	1
3	24700	0.0	0	0	0	1	2	2
4	24400	0.0	0	0	0	1	1	1
5	26800	0.0	0	0	0	1	1	1
6	25200	0.0	0	0	0	1	1	1
7	26500	0.0	0	0	0	1	1	1
8	24300	0.0	0	0	0	1	1	1
9	23500	0.0	0	0	0	1	0	0
10	23800	0.0	0	0	0	0	0	0
11	23300	0.0	0	0	0	0	0	0
12	26400	0.0	0	0	0	0	0	0
13	26900	0.0	0	0	0	0	0	0
14	25000	0.0	0	0	0	0	0	0
15	25900	0.0	0	0	0	0	0	0
16	21700	0.0	0	0	0	0	0	0
17	22100	0.0	0	0	0	0	0	0
18	24100	0.0	0	0	0	0	0	0
19	25000	0.0	0	0	0	0	0	0
20	22100	0.0	0	0	0	0	0	0
21	25700	0.0	0	0	0	0	0	0
22	22300	0.0	0	0	0	0	0	0
23	22300	0.0	0	0	0	0	0	0
24	22100	0.0	0	0	0	0	0	0
25	24100	0.0	0	0	0	0	0	0
26	27300	0.0	0	0	0	0	0	0
27	24500	0.0	0	0	0	0	0	0
28	21500	0.0	0	0	0	0	0	0
29	18900	0.0	0	0	0	0	0	0
30	19200	0.0	0	0	0	0	0	0
AVERAGE	23870	0.0	0	0	0	0	0	0

ASSUMPTIONS: Drift Rate = 0.0002%
TDS ppm = 0.63 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 1987
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	211	211	211	0.00E+00	15498	29000	0.001	0.000
2	211	211	211	0.00E+00	13797	29000	0.001	0.000
3	211	422	422	0.00E+00	15561	29000	0.002	0.000
4	211	211	211	0.00E+00	15372	29000	0.001	0.000
5	211	211	211	0.00E+00	16884	29000	0.001	0.000
6	211	211	211	0.00E+00	15876	29000	0.001	0.000
7	211	211	211	0.00E+00	16695	29000	0.001	0.000
8	211	211	211	0.00E+00	15309	29000	0.001	0.000
9	211	0	0	0.00E+00	14805	29000	0.000	0.000
10	0	0	0	0.00E+00	14994	29000	0.000	0.000
11	0	0	0	0.00E+00	14679	29000	0.000	0.000
12	0	0	0	0.00E+00	16632	29000	0.000	0.000
13	0	0	0	0.00E+00	16947	29000	0.000	0.000
14	0	0	0	0.00E+00	15750	29000	0.000	0.000
15	0	0	0	0.00E+00	16317	29000	0.000	0.000
16	0	0	0	0.00E+00	13671	29000	0.000	0.000
17	0	0	0	0.00E+00	13923	29000	0.000	0.000
18	0	0	0	0.00E+00	15183	29000	0.000	0.000
19	0	0	0	0.00E+00	15750	29000	0.000	0.000
20	0	0	0	0.00E+00	13923	29000	0.000	0.000
21	0	0	0	0.00E+00	16191	29000	0.000	0.000
22	0	0	0	0.00E+00	14049	29000	0.000	0.000
23	0	0	0	0.00E+00	14049	29000	0.000	0.000
24	0	0	0	0.00E+00	13923	29000	0.000	0.000
25	0	0	0	0.00E+00	15183	29000	0.000	0.000
26	0	0	0	0.00E+00	17199	29000	0.000	0.000
27	0	0	0	0.00E+00	15435	29000	0.000	0.000
28	0	0	0	0.00E+00	13545	29000	0.000	0.000
29	0	0	0	0.00E+00	11907	29000	0.000	0.000
30	0	0	0	0.00E+00	12096	29000	0.000	0.000
AVERAGE	63.30	63.30	63.30	0.00E+00	15038.10	29000	0.000	0.000

ASSUMPTIONS: Drift Rate = 0.0002%
TDS ppm = 0.63 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 1987
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	16800	0.0	0	0	0	0	0	0
2	21000	0.0	0	0	0	0	0	0
3	18400	0.0	0	0	0	0	0	0
4	18100	0.0	0	0	0	0	0	0
5	20400	0.0	0	0	0	0	0	0
6	16200	0.0	0	0	0	0	0	0
7	16000	0.0	0	0	0	0	0	0
8	14500	0.0	0	0	0	0	0	0
9	14300	0.0	0	0	0	0	0	0
10	14100	0.0	0	0	0	0	0	0
11	14000	0.0	0	0	0	0	0	0
12	16500	0.0	0	0	0	0	0	0
13	14300	0.0	0	0	0	0	0	0
14	14700	0.0	0	0	0	0	0	0
15	14700	0.0	0	0	0	0	0	0
16	13600	0.0	0	0	0	0	0	0
17	5790	0.0	0	0	0	0	0	0
18	9550	0.0	2	2	2	0	0	0
19	8840	0.0	2	2	2	0	0	0
20	17400	0.0	2	2	2	0	0	0
21	9110	0.0	2	2	2	0	0	0
22	9970	0.0	2	2	2	0	0	0
23	11540	0.0	2	2	2	0	0	0
24	9580	0.0	2	2	2	0	0	0
25	8240	0.0	2	2	2	0	0	0
26	7980	0.0	2	2	2	0	0	0
27	8290	0.0	2	2	2	0	0	0
28	8060	0.0	2	2	2	0	0	0
29	9220	0.0	2	2	2	0	0	0
30	6810	0.0	2	2	2	0	0	0
31	6310	0.0	2	2	2	0	0	0
AVERAGE	12719	0.0	1	1	1	0	0	0

ASSUMPTIONS: Drift Rate = 0.0002%
TDS ppm = 0.48 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 1987
CALCULATED TOWER PERFORMANCE PARAMETERS - UNIT 1

	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	0	0	0	0.00E+00	8064	29000	0.000	0.000
2	0	0	0	0.00E+00	10080	29000	0.000	0.000
3	0	0	0	0.00E+00	8832	29000	0.000	0.000
4	0	0	0	0.00E+00	8688	29000	0.000	0.000
5	0	0	0	0.00E+00	9792	29000	0.000	0.000
6	0	0	0	0.00E+00	7776	29000	0.000	0.000
7	0	0	0	0.00E+00	7680	29000	0.000	0.000
8	0	0	0	0.00E+00	6960	29000	0.000	0.000
9	0	0	0	0.00E+00	6864	29000	0.000	0.000
10	0	0	0	0.00E+00	6768	29000	0.000	0.000
11	0	0	0	0.00E+00	6720	29000	0.000	0.000
12	0	0	0	0.00E+00	7920	29000	0.000	0.000
13	0	0	0	0.00E+00	6864	29000	0.000	0.000
14	0	0	0	0.00E+00	7056	29000	0.000	0.000
15	0	0	0	0.00E+00	7056	29000	0.000	0.000
16	0	0	0	0.00E+00	6528	29000	0.000	0.000
17	0	0	0	0.00E+00	2779	29000	0.000	0.000
18	0	0	0	0.00E+00	4584	309000	0.000	0.000
19	0	0	0	0.00E+00	4243	309000	0.000	0.000
20	0	0	0	0.00E+00	8352	309000	0.000	0.000
21	0	0	0	0.00E+00	4373	309000	0.000	0.000
22	0	0	0	0.00E+00	4786	309000	0.000	0.000
23	0	0	0	0.00E+00	5539	309000	0.000	0.000
24	0	0	0	0.00E+00	4598	309000	0.000	0.000
25	0	0	0	0.00E+00	3955	309000	0.000	0.000
26	0	0	0	0.00E+00	3830	309000	0.000	0.000
27	0	0	0	0.00E+00	3979	309000	0.000	0.000
28	0	0	0	0.00E+00	3869	309000	0.000	0.000
29	0	0	0	0.00E+00	4426	309000	0.000	0.000
30	0	0	0	0.00E+00	3269	309000	0.000	0.000
31	0	0	0	0.00E+00	3029	309000	0.000	0.000
AVERAGE	0.00	0.00	0.00	0.00E+00	6105.14	155452	0.000	0.000

[illegible]MPTIONS: Drift Rate = 0.0002%
TDS ppm = 0.48 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 1987
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	13700	91108.8	4	4	4	42	32	48
	2	15000	91108.8	4	4	4	42	48	48
	3	20500	91108.8	4	4	4	42	48	48
	4	20200	91108.8	4	4	4	42	48	48
	5	22000	91108.8	4	4	4	42	48	48
	6	24600	91108.8	4	4	4	42	48	48
	7	27600	91108.8	4	4	4	42	48	48
	8	29000	91108.8	4	4	4	42	48	48
	9	27500	86731.2	4	4	4	42	48	48
	10	29300	1003.2	4	2	1	14	16	16
	11	29850	0	0	0	0	0	0	0
	12	30400	0	0	0	0	0	0	0
	13	31300	0	0	0	0	0	0	0
	14	28700	0	0	0	0	0	0	0
	15	29700	0	0	0	0	0	0	0
	16	30300	0	0	0	0	0	0	0
	17	29900	0	0	0	0	0	0	0
	18	30100	0	0	0	0	0	0	0
	19	29406	0	0	0	0	0	0	0
	20	25100	0	0	0	0	0	0	0
	21	25000	0	0	0	0	0	0	0
	22	26600	0	0	0	0	0	0	0
	23	29300	0	0	0	0	0	0	0
	24	23200	0	0	0	0	0	0	0
	25	25100	0	0	0	0	0	0	0
	26	27300	0	0	0	0	0	0	0
	27	27600	0	0	0	0	0	0	0
	28	27400	0	0	0	0	0	0	0
	29	27400	0	0	0	0	0	0	0
	30	27900	0	0	0	0	0	0	0
	31	27000	0	0	0	0	0	0	0
AVERAGE		26386	26342.1	1	1	1	13	14	14

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 1987
CALCULATED TOWER PERFORMANCE PARAMETERS - UNIT 2

		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	8862	6752	10128	2.16E+08	9727	589000	0.998	0.081
	2	8862	10128	10128	2.16E+08	10650	589000	1.129	0.100
	3	8862	10128	10128	2.16E+08	14555	589000	1.129	0.137
	4	8862	10128	10128	2.16E+08	14342	589000	1.129	0.135
	5	8862	10128	10128	2.16E+08	15620	589000	1.129	0.147
	6	8862	10128	10128	2.16E+08	17466	589000	1.129	0.165
	7	8862	10128	10128	2.16E+08	19596	589000	1.129	0.185
	8	8862	10128	10128	2.16E+08	20590	589000	1.129	0.194
	9	8862	10128	10128	2.06E+08	19525	589000	1.129	0.184
	10	2954	3376	3376	2.38E+06	20803	355667	0.227	0.039
	11	0	0	0	0.00E+00	21194	29000	0.000	0.000
	12	0	0	0	0.00E+00	21584	29000	0.000	0.000
	13	0	0	0	0.00E+00	22223	29000	0.000	0.000
	14	0	0	0	0.00E+00	20377	29000	0.000	0.000
	15	0	0	0	0.00E+00	21087	29000	0.000	0.000
	16	0	0	0	0.00E+00	21513	29000	0.000	0.000
	17	0	0	0	0.00E+00	21229	29000	0.000	0.000
	18	0	0	0	0.00E+00	21371	29000	0.000	0.000
	19	0	0	0	0.00E+00	20878	29000	0.000	0.000
	20	0	0	0	0.00E+00	17821	29000	0.000	0.000
	21	0	0	0	0.00E+00	17750	29000	0.000	0.000
	22	0	0	0	0.00E+00	18886	29000	0.000	0.000
	23	0	0	0	0.00E+00	20803	29000	0.000	0.000
	24	0	0	0	0.00E+00	16472	29000	0.000	0.000
	25	0	0	0	0.00E+00	17821	29000	0.000	0.000
	26	0	0	0	0.00E+00	19383	29000	0.000	0.000
	27	0	0	0	0.00E+00	19596	29000	0.000	0.000
	28	0	0	0	0.00E+00	19454	29000	0.000	0.000
	29	0	0	0	0.00E+00	19454	29000	0.000	0.000
	30	0	0	0	0.00E+00	19809	29000	0.000	0.000
	31	0	0	0	0.00E+00	19170	29000	0.000	0.000
AVERAGE		2668.13	2940.39	3049.29	6.24E+07	18733.83	202118	0.331	0.044

PTIONS: 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 1987
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	26100	0.0	0	0	0	0	0	0
2	27800	0.0	0	0	0	0	0	0
3	28100	0.0	0	0	0	0	0	0
4	27099	0.0	0	0	0	0	0	0
5	27400	0.0	0	0	0	0	0	0
6	25600	0.0	0	0	0	0	0	0
7	23300	0.0	0	0	0	0	0	0
8	23100	0.0	0	0	0	0	0	0
9	29099	0.0	0	0	0	0	0	0
10	20360	0.0	0	0	0	0	0	0
11	19700	0.0	0	0	0	0	0	0
12	20500	0.0	0	0	0	0	0	0
13	20500	0.0	0	0	0	0	0	0
14	20400	0.0	0	0	0	0	0	0
15	20500	0.0	0	0	0	0	0	0
16	21300	0.0	0	0	0	0	0	0
17	20000	0.0	0	0	0	0	0	0
18	21000	0.0	0	0	0	0	0	0
19	21900	0.0	0	0	0	0	0	0
20	19900	0.0	0	0	0	0	0	0
21	23300	0.0	0	0	0	0	0	0
22	21300	0.0	0	0	0	0	0	0
23	21500	0.0	0	0	0	0	0	0
24	21500	0.0	0	0	0	0	0	0
25	21700	0.0	0	0	0	0	0	0
26	21700	0.0	0	0	0	0	0	0
27	21300	0.0	0	0	0	0	0	0
28	20000	0.0	0	0	0	0	0	0
AVERAGE	22713	0.0	0	0	0	0	0	0

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 1987
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	0	0	0	0.00E+00	18531	29000	0.000	0.000
2	0	0	0	0.00E+00	19738	29000	0.000	0.000
3	0	0	0	0.00E+00	19951	29000	0.000	0.000
4	0	0	0	0.00E+00	19240	29000	0.000	0.000
5	0	0	0	0.00E+00	19454	29000	0.000	0.000
6	0	0	0	0.00E+00	18176	29000	0.000	0.000
7	0	0	0	0.00E+00	16543	29000	0.000	0.000
8	0	0	0	0.00E+00	16401	29000	0.000	0.000
9	0	0	0	0.00E+00	20660	29000	0.000	0.000
10	0	0	0	0.00E+00	14456	29000	0.000	0.000
11	0	0	0	0.00E+00	13987	29000	0.000	0.000
12	0	0	0	0.00E+00	14555	29000	0.000	0.000
13	0	0	0	0.00E+00	14555	29000	0.000	0.000
14	0	0	0	0.00E+00	14484	29000	0.000	0.000
15	0	0	0	0.00E+00	14555	29000	0.000	0.000
16	0	0	0	0.00E+00	15123	29000	0.000	0.000
17	0	0	0	0.00E+00	14200	29000	0.000	0.000
18	0	0	0	0.00E+00	14910	29000	0.000	0.000
19	0	0	0	0.00E+00	15549	29000	0.000	0.000
20	0	0	0	0.00E+00	14129	29000	0.000	0.000
21	0	0	0	0.00E+00	16543	29000	0.000	0.000
22	0	0	0	0.00E+00	15123	29000	0.000	0.000
23	0	0	0	0.00E+00	15265	29000	0.000	0.000
24	0	0	0	0.00E+00	15265	29000	0.000	0.000
25	0	0	0	0.00E+00	15407	29000	0.000	0.000
26	0	0	0	0.00E+00	15407	29000	0.000	0.000
27	0	0	0	0.00E+00	15123	29000	0.000	0.000
28	0	0	0	0.00E+00	14200	29000	0.000	0.000
AVERAGE	0.00	0.00	0.00	0.00E+00	16126	29000	0.000	0.000

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 1987
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	19100	0.0	0	0	0	0	0	0
	2	18300	0.0	0	0	0	0	0	0
	3	18100	0.0	0	0	0	0	0	0
	4	17700	0.0	0	0	0	0	0	0
	5	18200	0.0	0	4	4	0	0	0
	6	17100	0.0	4	4	4	0	0	0
	7	17000	0.0	4	4	4	0	0	0
	8	16500	0.0	4	4	4	0	0	0
	9	16300	2371.2	4	4	4	0	0	0
	10	17700	37547.0	4	4	3	24	28	0
	11	17700	13041.6	2	2	1	30	34	0
	12	17000	0.0	0	0	2	0	0	0
	13	16700	2736.0	4	4	4	0	0	0
	14	15500	37756.8	4	4	4	30	6	6
	15	18800	54674.4	4	2	2	44	41	11
	16	25200	51984.0	2	4	3	37	23	0
	17	21600	0.0	2	1	1	12	0	0
	18	19600	0.0	0	1	1	0	0	0
	19	21300	6019.2	1	1	1	0	0	0
	20	21600	5244.0	1	1	2	6	0	0
	21	16900	26356.8	2	4	4	20	0	0
	22	19700	44140.8	4	4	4	45	0	0
	23	19100	44049.6	4	4	4	37	3	0
	24	19900	44140.8	4	4	4	48	9	0
	25	21100	44414.4	4	4	4	48	15	0
	26	21450	44596.8	4	4	4	48	18	0
	27	21800	45964.8	4	4	4	48	8	0
	28	22800	80803.2	4	4	4	48	30	26
	29	21900	91017.6	4	4	4	48	44	48
	30	21400	77410.6	4	4	4	48	45	48
	31	21600	89011.2	4	4	4	48	42	48
AVERAGE		19311	27202.6	3	3	3	22	11	6

ASSUMPTIONS: Drift Rate = 0.0002%
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 1987
CALCULATED TOWER PERFORMANCE PARAMETERS - UNIT 2

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	0	0	0	0.00E+00	13370	29000	0.000	0.000
	2	0	0	0	0.00E+00	12810	29000	0.000	0.000
	3	0	0	0	0.00E+00	12670	29000	0.000	0.000
	4	0	0	0	0.00E+00	12390	29000	0.000	0.000
	5	0	0	0	0.00E+00	12740	402333	0.000	0.000
	6	0	0	0	0.00E+00	11970	589000	0.000	0.000
	7	0	0	0	0.00E+00	11900	589000	0.000	0.000
	8	0	0	0	0.00E+00	11550	589000	0.000	0.000
	9	0	0	0	5.62E+06	11410	589000	0.000	0.000
	10	5064	5908	0	8.90E+07	12390	542333	0.392	0.040
	11	6330	7174	0	3.09E+07	12390	262333	0.233	0.024
	12	0	0	0	0.00E+00	11900	122333	0.000	0.000
	13	0	0	0	6.48E+06	11690	589000	0.000	0.000
	14	6330	1266	1266	8.95E+07	10850	589000	0.344	0.031
	15	9284	8651	2321	1.30E+08	13160	402333	0.536	0.059
	16	7807	4853	0	1.23E+08	17640	449000	0.374	0.055
	17	2532	0	0	0.00E+00	15120	215667	0.036	0.005
	18	0	0	0	0.00E+00	13720	122333	0.000	0.000
	19	0	0	0	1.43E+07	14910	169000	0.000	0.000
	20	1266	0	0	1.24E+07	15120	215667	0.018	0.002
	21	4220	0	0	6.25E+07	11830	495667	0.138	0.014
	22	9495	0	0	1.05E+08	13790	589000	0.368	0.042
	23	7807	633	0	1.04E+08	13370	589000	0.327	0.037
	24	10128	1899	0	1.05E+08	13930	589000	0.466	0.054
	25	10128	3165	0	1.05E+08	14770	589000	0.515	0.064
	26	10128	3798	0	1.06E+08	15015	589000	0.540	0.068
	27	10128	1688	0	1.09E+08	15260	589000	0.458	0.058
	28	10128	6330	5486	1.92E+08	15960	589000	0.851	0.113
	29	10128	9284	10128	2.16E+08	15330	589000	1.145	0.147
	30	10128	9495	10128	1.83E+08	14980	589000	1.153	0.144
	31	10128	8862	10128	2.11E+08	15120	589000	1.129	0.142
AVERAGE		4553.52	2355.03	1272.81	6.45E+07	13517.90	417387	0.291	0.035

MPTIONS: Drift Rate = 0.0002%
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 1987
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	22300	90926.4	4	4	4	48	43	48
	2	23300	90835.2	4	4	4	48	45	48
	3	21400	91108.8	4	4	4	48	45	48
	4	21400	91108.8	4	4	4	48	45	48
	5	19400	90926.4	4	4	4	48	45	48
	6	20800	90926.4	4	4	4	48	45	48
	7	23400	90926.4	4	4	4	48	45	48
	8	23200	90835.2	4	4	4	48	42	48
	9	22500	90926.4	4	4	4	48	42	48
	10	20700	91017.6	4	4	4	48	43	48
	11	23000	91017.6	4	4	4	48	48	48
	12	23000	86457.6	4	4	4	48	48	48
	13	21000	90835.2	4	4	4	48	48	48
	14	22500	90835.2	4	4	4	48	48	48
	15	24000	90926.4	4	4	4	48	48	48
	16	26900	53078.4	4	4	3	40	38	40
	17	22000	17419.2	2	4	4	28	0	8
	18	23100	62016.0	4	4	4	43	6	46
	19	22600	76516.8	4	4	4	48	42	48
	20	21400	91017.6	4	4	4	48	45	48
	21	20500	90926.4	4	4	4	48	45	48
	22	20550	91017.6	4	4	4	48	45	48
	23	22800	91017.6	4	4	4	48	45	48
	24	23400	91017.6	4	4	4	48	33	48
	25	22300	87825.6	4	4	4	48	45	48
	26	23800	82353.6	4	4	4	48	30	48
	27	21600	82444.8	4	4	4	48	31	48
	28	22200	82444.8	4	4	4	48	33	42
	29	21600	82444.8	4	4	4	48	31	48
	30	22200	82353.6	4	4	4	42	28	40
AVERAGE		22295	84116.8	4	4	4	47	39	46

ASSUMPTIONS: Drift Rate = 0.0002%
TDS ppm = 0.61 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 1987
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	10128	9073	10128	2.15E+08	13603	589000	1.137	0.129
	2	10128	9495	10128	2.15E+08	14213	589000	1.153	0.137
	3	10128	9495	10128	2.16E+08	13054	589000	1.153	0.126
	4	10128	9495	10128	2.16E+08	13054	589000	1.153	0.126
	5	10128	9495	10128	2.15E+08	11834	589000	1.153	0.114
	6	10128	9495	10128	2.15E+08	12688	589000	1.153	0.122
	7	10128	9495	10128	2.15E+08	14274	589000	1.153	0.137
	8	10128	8862	10128	2.15E+08	14152	589000	1.129	0.133
	9	10128	8862	10128	2.15E+08	13725	589000	1.129	0.129
	10	10128	9073	10128	2.16E+08	12627	589000	1.137	0.120
	11	10128	10128	10128	2.16E+08	14030	589000	1.178	0.138
	12	10128	10128	10128	2.05E+08	14030	589000	1.178	0.138
	13	10128	10128	10128	2.15E+08	12810	589000	1.178	0.126
	14	10128	10128	10128	2.15E+08	13725	589000	1.178	0.135
	15	10128	10128	10128	2.15E+08	14640	589000	1.178	0.144
	16	8440	8018	8440	1.26E+08	16409	542333	0.889	0.122
	17	5908	0	1688	4.13E+07	13420	495667	0.248	0.028
	18	9073	1266	9706	1.47E+08	14091	589000	0.777	0.091
	19	10128	8862	10128	1.81E+08	13786	589000	1.129	0.130
	20	10128	9495	10128	2.16E+08	13054	589000	1.153	0.126
	21	10128	9495	10128	2.15E+08	12505	589000	1.153	0.120
	22	10128	9495	10128	2.16E+08	12536	589000	1.153	0.121
	23	10128	9495	10128	2.16E+08	13908	589000	1.153	0.134
	24	10128	6963	10128	2.16E+08	14274	589000	1.055	0.126
	25	10128	9495	10128	2.08E+08	13603	589000	1.153	0.131
	26	10128	6330	10128	1.95E+08	14518	589000	1.031	0.125
	27	10128	6541	10128	1.95E+08	13176	589000	1.039	0.114
	28	10128	6963	8862	1.95E+08	13542	589000	1.006	0.114
	29	10128	6541	10128	1.95E+08	13176	589000	1.039	0.114
	30	8862	5908	8440	1.95E+08	13542	589000	0.900	0.102
AVERAGE		9853.70	8278.23	9677.87	1.99E+08	13599.95	584333	1.074	0.122

ASSUMPTIONS: Drift Rate = 0.0002%
TDS ppm = 0.61 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 1987
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	20600	82171.2	4	4	4	36	33	34
	2	22100	82080.0	4	4	4	30	33	37
	3	21800	82171.2	4	4	4	30	35	30
	4	22300	82080.0	4	4	4	17	41	39
	5	22700	85089.6	4	4	4	28	44	36
	6	21800	90105.6	4	4	4	44	45	45
	7	20400	90652.8	4	4	4	45	45	46
	8	20600	90926.4	4	4	4	45	45	48
	9	21200	90926.4	4	4	4	46	46	48
	10	22600	47788.8	4	4	4	39	39	39
	11	21300	0.0	4	4	3	0	0	0
	12	22500	0.0	2	0	1	0	0	0
	13	21900	0.0	0	0	0	0	0	0
	14	20000	0.0	0	0	0	0	0	0
	15	20500	0.0	2	2	2	0	0	0
	16	19800	30004.8	2	4	4	12	8	3
	17	20700	90196.8	4	4	4	45	45	38
	18	22000	90835.2	4	4	4	45	45	42
	19	23300	90926.4	4	4	4	46	46	41
	20	25800	90926.4	4	4	4	46	46	41
	21	29400	90926.4	4	4	4	45	45	44
	22	26500	90926.4	4	4	4	39	42	41
	23	26200	90926.4	4	4	4	46	39	39
	24	25800	91017.6	4	4	4	48	39	39
	25	27000	91017.6	4	4	4	48	35	45
	26	27100	91017.6	4	4	4	48	35	36
	27	29260	90926.4	4	4	4	48	33	35
	28	25100	90926.4	4	4	4	48	33	45
	29	26600	90926.4	4	4	4	42	40	44
	30	19700	91017.6	4	4	4	47	41	46
	31	24100	91108.8	4	4	4	48	42	48
AVERAGE		23247	71536.1	4	4	4	34	33	33

ASSUMPTIONS: Drift Rate = 0.0002%
TDS ppm = 0.63 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 1987
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	7596	6963	7174	1.95E+08	12978	589000	0.843	0.091
	2	6330	6963	7807	1.95E+08	13923	589000	0.818	0.095
	3	6330	7385	6330	1.95E+08	13734	589000	0.777	0.089
	4	3587	8651	8229	1.95E+08	14049	589000	0.794	0.093
	5	5908	9284	7596	2.02E+08	14301	589000	0.884	0.105
	6	9284	9495	9495	2.14E+08	13734	589000	1.096	0.126
	7	9495	9495	9706	2.15E+08	12852	589000	1.113	0.119
	8	9495	9495	10128	2.15E+08	12978	589000	1.129	0.122
	9	9706	9706	10128	2.15E+08	13356	589000	1.145	0.128
	10	8229	8229	8229	1.13E+08	14238	589000	0.957	0.114
	11	0	0	0	0.00E+00	13419	542333	0.000	0.000
	12	0	0	0	0.00E+00	14175	169000	0.000	0.000
	13	0	0	0	0.00E+00	13797	29000	0.000	0.000
	14	0	0	0	0.00E+00	12600	29000	0.000	0.000
	15	0	0	0	0.00E+00	12915	309000	0.000	0.000
	16	2532	1688	633	7.11E+07	12474	495667	0.158	0.016
	17	9495	9495	8018	2.14E+08	13041	589000	1.047	0.114
	18	9495	9495	8862	2.15E+08	13860	589000	1.080	0.125
	19	9706	9706	8651	2.15E+08	14679	589000	1.088	0.133
	20	9706	9706	8651	2.15E+08	16254	589000	1.088	0.148
	21	9495	9495	9284	2.15E+08	18522	589000	1.096	0.169
	22	8229	8862	8651	2.15E+08	16695	589000	0.998	0.139
	23	9706	8229	8229	2.15E+08	16506	589000	1.014	0.140
	24	10128	8229	8229	2.16E+08	16254	589000	1.031	0.140
	25	10128	7385	9495	2.16E+08	17010	589000	1.047	0.149
	26	10128	7385	7596	2.16E+08	17073	589000	0.973	0.139
	27	10128	6963	7385	2.15E+08	18434	589000	0.949	0.146
	28	10128	6963	9495	2.15E+08	15813	589000	1.031	0.136
	29	8862	8440	9284	2.15E+08	16758	589000	1.031	0.144
	30	9917	8651	9706	2.16E+08	12411	589000	1.096	0.114
	31	10128	8862	10128	2.16E+08	15183	589000	1.129	0.143
AVERAGE		7221.65	6942.58	7003.84	1.70E+08	14645.67	525774	0.820	0.102

MPTIONS: Drift Rate = 0.0002%
TDS ppm = 0.63 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 1987
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	23500	91017.6	4	4	4	48	42	48
	2	25500	91017.6	4	4	4	48	42	48
	3	24800	91017.6	4	4	4	48	42	48
	4	24500	53625.6	4	4	4	40	35	40
	5	25900	0.0	4	2	2	0	0	0
	6	30700	41040.0	2	4	4	26	7	8
	7	24100	9211.2	4	2	2	24	17	19
	8	24100	54081.6	2	4	4	46	21	13
	9	21200	64660.8	4	4	4	45	32	4
	10	23600	72960.0	4	4	4	45	29	25
	11	28700	90926.4	4	4	4	45	39	45
	12	22900	90835.2	4	4	4	45	39	45
	13	24800	90926.4	4	4	4	45	39	45
	14	29520	90926.4	4	4	4	45	39	45
	15	22800	91017.6	4	4	4	46	39	46
	16	22000	90926.4	4	4	4	48	39	48
	17	21900	91017.6	4	4	4	48	39	48
	18	24700	90926.4	4	4	4	45	40	48
	19	23700	90744.0	4	4	4	45	44	42
	20	24800	90744.0	4	4	4	45	42	48
	21	24800	90744.0	4	4	4	42	42	48
	22	24100	90835.2	4	4	4	45	42	48
	23	23300	90926.4	4	4	4	45	42	48
	24	21500	91017.6	4	4	4	45	42	48
	25	26800	90835.2	4	4	4	45	43	48
	26	24980	90744.0	4	4	4	45	45	48
	27	23400	89102.4	4	4	4	45	45	48
	28	26000	77976.0	4	4	4	45	45	47
	29	31100	90470.4	4	4	4	45	44	45
	30	25100	90196.8	4	4	4	45	45	40
AVERAGE		24827	79015.7	4	4	4	42	37	39

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 1987
CALCULATED TOWER PERFORMANCE PARAMETERS - UNIT 2

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	10128	8862	10128	2.16E+08	17155	589000	1.129	0.162
	2	10128	8862	10128	2.16E+08	18615	589000	1.129	0.175
	3	10128	8862	10128	2.16E+08	18104	589000	1.129	0.171
	4	8440	7385	8440	1.27E+08	17885	589000	0.941	0.140
	5	0	0	0	0.00E+00	18907	402333	0.000	0.000
	6	5486	1477	1688	9.73E+07	22411	495667	0.282	0.053
	7	5064	3587	4009	2.18E+07	17593	402333	0.335	0.049
	8	9706	4431	2743	1.28E+08	17593	495667	0.551	0.081
	9	9495	6752	844	1.53E+08	15476	589000	0.663	0.086
	10	9495	6119	5275	1.73E+08	17228	589000	0.810	0.116
	11	9495	8229	9495	2.15E+08	20951	589000	1.055	0.185
	12	9495	8229	9495	2.15E+08	16717	589000	1.055	0.147
	13	9495	8229	9495	2.15E+08	18104	589000	1.055	0.159
	14	9495	8229	9495	2.15E+08	21550	589000	1.055	0.190
	15	9706	8229	9706	2.16E+08	16644	589000	1.072	0.149
	16	10128	8229	10128	2.15E+08	16060	589000	1.104	0.148
	17	10128	8229	10128	2.16E+08	15987	589000	1.104	0.147
	18	9495	8440	10128	2.15E+08	18031	589000	1.088	0.164
	19	9495	9284	8862	2.15E+08	17301	589000	1.072	0.155
	20	9495	8862	10128	2.15E+08	18104	589000	1.104	0.167
	21	8862	8862	10128	2.15E+08	18104	589000	1.080	0.163
	22	9495	8862	10128	2.15E+08	17593	589000	1.104	0.162
	23	9495	8862	10128	2.15E+08	17009	589000	1.104	0.157
	24	9495	8862	10128	2.16E+08	15695	589000	1.104	0.145
	25	9495	9073	10128	2.15E+08	19564	589000	1.113	0.182
	26	9495	9495	10128	2.15E+08	18235	589000	1.129	0.172
	27	9495	9495	10128	2.11E+08	17082	589000	1.129	0.161
	28	9495	9495	9917	1.85E+08	18980	589000	1.121	0.178
	29	9495	9284	9495	2.14E+08	22703	589000	1.096	0.208
	30	9495	9495	8440	2.14E+08	18323	589000	1.063	0.163
AVERAGE		8960.47	7743.70	8306.37	1.87E+08	18123.47	570333	0.959	0.144

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 1987
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	24900	90835.2	4	4	4	46	46	46
	2	21800	90926.4	4	4	4	46	45	45
	3	24400	91017.6	4	4	4	45	45	45
	4	25100	91017.6	4	4	4	45	45	45
	5	23100	90926.4	4	4	4	45	45	45
	6	24700	90926.4	4	4	4	45	41	43
	7	22400	90926.4	4	4	4	45	42	45
	8	20500	90835.2	4	4	4	47	45	46
	9	26500	90926.4	4	4	4	46	42	44
	10	22600	91017.6	4	4	4	46	46	46
	11	21900	91017.6	4	4	4	46	46	46
	12	26400	91017.6	4	4	4	46	46	46
	13	21500	90789.6	4	4	4	46	46	46
	14	25900	90835.2	4	4	4	46	46	46
	15	27100	90835.2	4	4	4	46	46	46
	16	25800	91017.6	4	4	4	46	46	46
	17	24300	91017.6	4	4	4	46	46	46
	18	25800	91200.0	4	4	4	46	46	46
	19	26100	91108.8	4	4	4	46	46	46
	20	32000	91108.8	4	4	4	46	46	46
	21	24600	91017.6	4	4	4	46	46	46
	22	29500	71956.8	4	4	4	46	46	23
	23	27100	1520.0	4	4	4	0	0	0
	24	33600	47332.8	4	4	4	0	7	27
	25	28900	90926.4	4	4	4	47	46	46
	26	26700	91017.6	4	4	4	46	46	46
	27	27300	91017.6	4	4	4	46	46	46
	28	27920	91017.6	4	4	4	46	46	46
	29	26300	91017.6	4	4	4	46	46	46
	30	27600	90935.5	4	4	4	46	46	46
	31	25800	90880.8	4	4	4	46	46	46
AVERAGE		25746	86062.7	4	4	4	43	43	43

ASSUMPTIONS: Drift Rate = 0.0002%
TDS ppm = 0.68 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 1987
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	9706	9706	9706	2.15E+08	16932	589000	1.129	0.160
	2	9706	9495	9495	2.15E+08	14824	589000	1.113	0.138
	3	9495	9495	9495	2.16E+08	16592	589000	1.104	0.153
	4	9495	9495	9495	2.16E+08	17068	589000	1.104	0.157
	5	9495	9495	9495	2.15E+08	15708	589000	1.104	0.145
	6	9495	8651	9073	2.15E+08	16796	589000	1.055	0.148
	7	9495	8862	9495	2.15E+08	15232	589000	1.080	0.137
	8	9917	9495	9706	2.15E+08	13940	589000	1.129	0.131
	9	9706	8862	9284	2.15E+08	18020	589000	1.080	0.162
	10	9706	9706	9706	2.16E+08	15368	589000	1.129	0.145
	11	9706	9706	9706	2.16E+08	14892	589000	1.129	0.140
	12	9706	9706	9706	2.16E+08	17952	589000	1.129	0.169
	13	9706	9706	9706	2.15E+08	14620	589000	1.129	0.138
	14	9706	9706	9706	2.15E+08	17612	589000	1.129	0.166
	15	9706	9706	9706	2.15E+08	18428	589000	1.129	0.174
	16	9706	9706	9706	2.16E+08	17544	589000	1.129	0.165
	17	9706	9706	9706	2.16E+08	16524	589000	1.129	0.156
	18	9706	9706	9706	2.16E+08	17544	589000	1.129	0.165
	19	9706	9706	9706	2.16E+08	17748	589000	1.129	0.167
	20	9706	9706	9706	2.16E+08	21760	589000	1.129	0.205
	21	9706	9706	9706	2.16E+08	16728	589000	1.129	0.158
	22	9706	9706	4853	1.71E+08	20060	589000	0.941	0.157
	23	0	0	0	3.60E+06	18428	589000	0.000	0.000
	24	0	1477	5697	1.12E+08	22848	589000	0.278	0.053
	25	9917	9706	9706	2.15E+08	19652	589000	1.137	0.186
	26	9706	9706	9706	2.16E+08	18156	589000	1.129	0.171
	27	9706	9706	9706	2.16E+08	18564	589000	1.129	0.175
	28	9706	9706	9706	2.16E+08	18986	589000	1.129	0.179
	29	9706	9706	9706	2.16E+08	17884	589000	1.129	0.168
	30	9706	9706	9706	2.16E+08	18768	589000	1.129	0.177
	31	9706	9706	9706	2.15E+08	17544	589000	1.129	0.165
AVERAGE		9059.39	9004.94	9038.97	2.04E+08	17507.15	589000	1.051	0.152

UMPTIONS: Drift Rate = 0.0002%
TDS ppm = 0.68 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 1987
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	24300	90926.4	4	4	4	46	46	46
	2	22000	90744.0	4	4	4	46	46	46
	3	24800	90835.2	4	4	4	46	46	46
	4	26300	90926.4	4	4	4	46	46	46
	5	24000	91017.6	4	4	4	46	46	46
	6	31900	90926.4	4	4	4	46	46	46
	7	28000	90744.0	4	4	4	46	46	46
	8	27000	90835.2	4	4	4	46	46	46
	9	28100	90926.4	4	4	4	46	46	46
	10	24400	90926.4	4	4	4	46	46	46
	11	24500	90926.4	4	4	4	46	46	46
	12	23300	90926.4	4	4	4	46	46	46
	13	24700	90926.4	4	4	4	46	46	46
	14	23700	90926.4	4	4	4	46	46	46
	15	24000	90835.2	4	4	4	46	46	46
	16	26800.	90744.0	4	4	4	46	46	46
	17	23300	90926.4	4	4	4	46	46	46
	18	25500	90835.2	4	4	4	46	46	46
	19	24600	91017.6	4	4	4	46	46	46
	20	21700	90926.4	4	4	4	46	46	46
	21	19100	89376.0	4	4	4	45	45	45
	22	19600	81897.6	4	4	4	45	40	42
	23	23600	90835.2	4	4	4	44	45	45
	24	19700	90926.4	4	4	4	45	45	45
	25	24700	90835.2	4	4	4	45	45	45
	26	24400	90926.4	4	4	4	45	45	45
	27	25900	90926.4	4	4	4	45	45	46
	28	19300	90926.4	4	4	4	46	46	46
	29	23400	91017.6	4	4	4	46	46	46
	30	22200	91017.6	4	4	4	46	46	46
	31	22400	90880.8	4	4	4	46	46	46
AVERAGE		24103	90560.1	4	4	4	46	46	46

ASSUMPTIONS: Drift Rate = 0.0002%
TDS ppm = 1.00 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 1987
CALCULATED TOWER PERFORMANCE PARAMETERS - UNIT 2

		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	9706	9706	9706	2.15E+08	24300	589000	1.129	0.229
	2	9706	9706	9706	2.15E+08	22000	589000	1.129	0.207
	3	9706	9706	9706	2.15E+08	24800	589000	1.129	0.234
	4	9706	9706	9706	2.15E+08	26300	589000	1.129	0.248
	5	9706	9706	9706	2.16E+08	24000	589000	1.129	0.226
	6	9706	9706	9706	2.15E+08	31900	589000	1.129	0.301
	7	9706	9706	9706	2.15E+08	28000	589000	1.129	0.264
	8	9706	9706	9706	2.15E+08	27000	589000	1.129	0.254
	9	9706	9706	9706	2.15E+08	28100	589000	1.129	0.265
	10	9706	9706	9706	2.15E+08	24400	589000	1.129	0.230
	11	9706	9706	9706	2.15E+08	24500	589000	1.129	0.231
	12	9706	9706	9706	2.15E+08	23300	589000	1.129	0.220
	13	9706	9706	9706	2.15E+08	24700	589000	1.129	0.233
	14	9706	9706	9706	2.15E+08	23700	589000	1.129	0.223
	15	9706	9706	9706	2.15E+08	24000	589000	1.129	0.226
	16	9706	9706	9706	2.15E+08	26800	589000	1.129	0.252
	17	9706	9706	9706	2.15E+08	23300	589000	1.129	0.220
	18	9706	9706	9706	2.15E+08	25500	589000	1.129	0.240
	19	9706	9706	9706	2.16E+08	24600	589000	1.129	0.232
	20	9706	9706	9706	2.15E+08	21700	589000	1.129	0.204
	21	9495	9495	9495	2.12E+08	19100	589000	1.104	0.176
	22	9495	8440	8862	1.94E+08	19600	589000	1.039	0.170
	23	9284	9495	9495	2.15E+08	23600	589000	1.096	0.216
	24	9495	9495	9495	2.15E+08	19700	589000	1.104	0.182
	25	9495	9495	9495	2.15E+08	24700	589000	1.104	0.228
	26	9495	9495	9495	2.15E+08	24400	589000	1.104	0.225
	27	9495	9495	9706	2.15E+08	25900	589000	1.113	0.240
	28	9706	9706	9706	2.15E+08	19300	589000	1.129	0.182
	29	9706	9706	9706	2.16E+08	23400	589000	1.129	0.220
	30	9706	9706	9706	2.16E+08	22200	589000	1.129	0.209
	31	9706	9706	9706	2.15E+08	22400	589000	1.129	0.211
AVERAGE		9651.55	9624.32	9644.74	2.15E+08	24103.23	589000	1.121	0.226

MPTIONS: Drift Rate = 0.0002%
TDS ppm = 1.00 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 1987
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	23000	90926.4	4	4	4	46	46	46
2	21100	91017.6	4	4	4	46	46	46
3	21700	90926.4	4	4	4	46	46	46
4	19280	91017.6	4	4	4	46	46	47
5	20200	91017.6	4	4	4	47	47	47
6	20700	91017.6	4	4	4	47	47	47
7	22700	90926.4	4	4	4	47	47	47
8	22600	90926.4	4	4	4	47	47	47
9	22800	90926.4	4	4	4	47	47	47
10	21000.	90917.3	4	4	4	47	46	47
11	22600	90908.2	4	4	4	47	47	47
12	26700	90926.4	4	4	4	47	47	47
13	22600	89512.8	4	4	4	47	47	47
14	23000	90926.4	4	4	4	47	47	47
15	21900	90926.4	4	4	4	46	46	46
16	21500	90926.4	4	4	4	46	46	46
17	18800	90908.2	4	4	4	46	46	46
18	20700	90853.4	4	4	4	46	46	46
19	24600	90899.0	4	4	4	46	46	46
20	21100	90944.6	4	4	4	46	46	46
21	22100	90972.0	4	4	4	46	46	46
22	22800	90981.1	4	4	4	46	46	46
23	24600	90981.1	4	4	4	45	45	46
24	22900	90908.2	4	4	4	46	46	46
25	22300	88391.0	4	4	4	46	47	47
26	23700	78340.8	4	4	4	46	46	46
27	24200	75960.5	4	4	4	46	46	37
28	24700	65290.1	4	4	4	28	28	35
29	23500	90771.4	4	4	4	42	44	45
30	25000	90707.5	4	4	4	42	48	48
AVERAGE	22479	89022	4	4	4	45	46	46

ASSUMPTIONS: Drift Rate = 0.0002%
TDS ppm = 0.90 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 1987
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	9706	9706	9706	2.15E+08	20700	589000	1.129	0.195
2	9706	9706	9706	2.16E+08	18990	589000	1.129	0.179
3	9706	9706	9706	2.15E+08	19530	589000	1.129	0.184
4	9706	9706	9917	2.16E+08	17352	589000	1.137	0.165
5	9917	9917	9917	2.16E+08	18180	589000	1.153	0.175
6	9917	9917	9917	2.16E+08	18630	589000	1.153	0.179
7	9917	9917	9917	2.15E+08	20430	589000	1.153	0.197
8	9917	9917	9917	2.15E+08	20340	589000	1.153	0.196
9	9917	9917	9917	2.15E+08	20520	589000	1.153	0.198
10	9917	9706	9917	2.15E+08	18900	589000	1.145	0.181
11	9917	9917	9917	2.15E+08	20340	589000	1.153	0.196
12	9917	9917	9917	2.15E+08	24030	589000	1.153	0.231
13	9917	9917	9917	2.12E+08	20340	589000	1.153	0.196
14	9917	9917	9917	2.15E+08	20700	589000	1.153	0.199
15	9706	9706	9706	2.15E+08	19710	589000	1.129	0.186
16	9706	9706	9706	2.15E+08	19350	589000	1.129	0.182
17	9706	9706	9706	2.15E+08	16920	589000	1.129	0.159
18	9706	9706	9706	2.15E+08	18630	589000	1.129	0.176
19	9706	9706	9706	2.15E+08	22140	589000	1.129	0.209
20	9706	9706	9706	2.16E+08	18990	589000	1.129	0.179
21	9706	9706	9706	2.16E+08	19890	589000	1.129	0.187
22	9706	9706	9706	2.16E+08	20520	589000	1.129	0.193
23	9495	9495	9706	2.16E+08	22140	589000	1.113	0.206
24	9706	9706	9706	2.15E+08	20610	589000	1.129	0.194
25	9706	9917	9917	2.09E+08	20070	589000	1.145	0.192
26	9706	9706	9706	1.86E+08	21330	589000	1.129	0.201
27	9706	9706	7807	1.80E+08	21780	589000	1.055	0.192
28	5908	5908	7385	1.55E+08	22230	589000	0.744	0.138
29	8862	9284	9495	2.15E+08	21150	589000	1.072	0.189
30	8862	10128	10128	2.15E+08	22500	589000	1.129	0.212
AVERAGE	9586	9643	9657	2.11E+08	20231	589000	1.120	0.189

ASSUMPTIONS: Drift Rate = 0.0002%
TDS ppm = 0.90 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 1987
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	28600	90953.8	4	4	4	40	48	48
	2	20200	90953.8	4	4	4	39	48	48
	3	24400	90944.6	4	4	4	39	48	48
	4	28600	90871.7	4	4	4	39	48	48
	5	29900	90661.9	4	4	4	39	48	48
	6	27300	90908.2	4	4	4	39	48	48
	7	26600	90981.1	4	4	4	39	48	48
	8	26600	90981.1	4	4	4	40	48	48
	9	27500	90972.0	4	4	4	42	48	48
	10	26800	90981.1	4	4	4	42	48	48
	11	26200	90962.9	4	4	4	42	48	48
	12	25600	90798.7	4	4	4	42	48	48
	13	28900	90926.4	4	4	4	42	48	47
	14	27900	90780.5	4	4	4	42	48	48
	15	25900	90579.8	4	4	4	44	48	48
	16	26900	90880.8	4	4	4	45	48	48
	17	26900	90771.4	4	4	4	45	48	48
	18	28000	90826.1	4	4	4	45	48	44
	19	27700	90880.8	4	4	4	45	48	48
	20	26400	90917.3	4	4	4	45	48	48
	21	25800	90908.2	4	4	4	45	48	44
	22	27700	90817.0	4	4	4	45	48	48
	23	28400	90260.6	4	4	4	45	48	48
	24	27800	74373.6	4	4	4	45	48	39
	25	28600	85363.2	4	4	4	43	46	38
	26	28500	90899.0	4	4	4	45	48	45
	27	28100	90880.8	4	4	4	45	48	46
	28	27100	90807.8	4	4	4	42	47	48
	29	28200	90889.9	4	4	4	42	48	48
	30	27700	90926.4	4	4	4	42	48	48
	31	30200	91026.7	4	4	4	42	48	48
AVERAGE		27258	90151.2	4	4	4	42	48	47

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 1987
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	8440	10128	10128	2.16E+08	20878	589000	1.113	0.194
	2	8229	10128	10128	2.16E+08	14746	589000	1.104	0.136
	3	8229	10128	10128	2.16E+08	17812	589000	1.104	0.164
	4	8229	10128	10128	2.15E+08	20878	589000	1.104	0.192
	5	8229	10128	10128	2.15E+08	21827	589000	1.104	0.201
	6	8229	10128	10128	2.15E+08	19929	589000	1.104	0.184
	7	8229	10128	10128	2.16E+08	19418	589000	1.104	0.179
	8	8440	10128	10128	2.16E+08	19418	589000	1.113	0.180
	9	8862	10128	10128	2.16E+08	20075	589000	1.129	0.189
	10	8862	10128	10128	2.16E+08	19564	589000	1.129	0.184
	11	8862	10128	10128	2.16E+08	19126	589000	1.129	0.180
	12	8862	10128	10128	2.15E+08	18688	589000	1.129	0.176
	13	8862	10128	9917	2.15E+08	21097	589000	1.121	0.197
	14	8862	10128	10128	2.15E+08	20367	589000	1.129	0.192
	15	9284	10128	10128	2.15E+08	18907	589000	1.145	0.181
	16	9495	10128	10128	2.15E+08	19637	589000	1.153	0.189
	17	9495	10128	10128	2.15E+08	19637	589000	1.153	0.189
	18	9495	10128	9284	2.15E+08	20440	589000	1.121	0.191
	19	9495	10128	10128	2.15E+08	20221	589000	1.153	0.195
	20	9495	10128	10128	2.15E+08	19272	589000	1.153	0.186
	21	9495	10128	9284	2.15E+08	18834	589000	1.121	0.176
	22	9495	10128	10128	2.15E+08	20221	589000	1.153	0.195
	23	9495	10128	10128	2.14E+08	20732	589000	1.153	0.200
	24	9495	10128	8229	1.76E+08	20294	589000	1.080	0.183
	25	9073	9706	8018	2.02E+08	20878	589000	1.039	0.181
	26	9495	10128	9495	2.15E+08	20805	589000	1.129	0.196
	27	9495	10128	9706	2.15E+08	20513	589000	1.137	0.195
	28	8862	9917	10128	2.15E+08	19783	589000	1.121	0.185
	29	8862	10128	10128	2.15E+08	20586	589000	1.129	0.194
	30	8862	10128	10128	2.15E+08	20221	589000	1.129	0.190
	31	8862	10128	10128	2.16E+08	22046	589000	1.129	0.208
AVERAGE		8957.29	10107.58	9903.39	2.14E+08	19898.39	589000	1.123	0.186

MPTIONS: 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 1987
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	28300	91008.5	4	4	4	42	48	48
2	27200	91008.5	4	4	4	43	48	48
3	28400	90990.2	4	4	4	45	48	48
4	28500	91072.3	4	4	4	43	48	48
5	28400	91017.6	4	4	4	42	48	48
6	29000	91035.8	4	4	4	42	48	48
7	27300	91136.2	4	4	4	42	48	48
8	28800	91117.9	4	4	4	42	48	48
9	27400	91099.7	4	4	4	42	48	48
10	27500	91108.8	4	4	4	42	47	48
11	27400	91035.8	4	4	4	42	48	48
12	27800	91045.0	4	4	4	42	48	48
13	29100	91145.3	4	4	4	42	48	48
14	30200	91136.2	4	4	4	42	48	48
15	29000	91127.0	4	4	4	42	48	48
16	23500	91072.3	4	4	4	42	48	48
17	26600	91145.3	4	4	4	39	48	45
18	26800	91090.6	4	4	4	40	48	45
19	27900	91145.3	4	4	4	40	48	43
20	28600	88619.0	4	4	4	40	42	33
21	29200	4605.6	4	1	2	14	16	11
22	25200	0.0	3	2	3	0	0	0
23	26400	912.0	4	4	4	0	0	0
24	27700	33424.8	4	4	4	6	7	0
25	28900	87378.7	4	4	4	35	42	15
26	30500	90990.2	4	4	4	36	48	32
27	26700	91035.8	4	4	4	36	48	33
28	31400	91035.8	4	4	4	36	48	33
29	28400	91072.3	4	4	4	36	48	33
30	28500	91099.7	4.	4	4	36	48	33
AVERAGE	28020	80023.7	4	4	4	36	42	37

ASSUMPTIONS: Drift Rate = 0.0002%
TDS ppm = 0.63 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 1987
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	8862	10128	10128	2.16E+08	17829	589000	1.129	0.168
2	9073	10128	10128	2.16E+08	17136	589000	1.137	0.163
3	9495	10128	10128	2.16E+08	17892	589000	1.153	0.172
4	9073	10128	10128	2.16E+08	17955	589000	1.137	0.170
5	8862	10128	10128	2.16E+08	17892	589000	1.129	0.169
6	8862	10128	10128	2.16E+08	18270	589000	1.129	0.172
7	8862	10128	10128	2.16E+08	17199	589000	1.129	0.162
8	8862	10128	10128	2.16E+08	18144	589000	1.129	0.171
9	8862	10128	10128	2.16E+08	17262	589000	1.129	0.163
10	8862	9917	10128	2.16E+08	17325	589000	1.121	0.162
11	8862	10128	10128	2.16E+08	17262	589000	1.129	0.163
12	8862	10128	10128	2.16E+08	17514	589000	1.129	0.165
13	8862	10128	10128	2.16E+08	18333	589000	1.129	0.173
14	8862	10128	10128	2.16E+08	19026	589000	1.129	0.179
15	8862	10128	10128	2.16E+08	18270	589000	1.129	0.172
16	8862	10128	10128	2.16E+08	14805	589000	1.129	0.139
17	8229	10128	9495	2.16E+08	16758	589000	1.080	0.151
18	8440	10128	9495	2.16E+08	16884	589000	1.088	0.153
19	8440	10128	9073	2.16E+08	17577	589000	1.072	0.157
20	8440	8862	6963	2.10E+08	18018	589000	0.941	0.141
21	2954	3376	2321	1.09E+07	18396	355667	0.203	0.031
22	0	0	0	0.00E+00	15876	402333	0.000	0.000
23	0	0	0	2.16E+06	16632	589000	0.000	0.000
24	1266	1477	0	7.92E+07	17451	589000	0.106	0.015
25	7385	8862	3165	2.07E+08	18207	589000	0.753	0.114
26	7596	10128	6752	2.16E+08	19215	589000	0.949	0.152
27	7596	10128	6963	2.16E+08	16821	589000	0.957	0.134
28	7596	10128	6963	2.16E+08	19782	589000	0.957	0.158
29	7596	10128	6963	2.16E+08	17892	589000	0.957	0.143
30	7596	10128	6963	2.16E+08	17955	589000	0.957	0.143
AVERAGE	7532.70	8847.93	7905.47	1.90E+08	17652.60	575000	0.937	0.139

MPTIONS: Drift Rate = 0.0002%
TDS ppm = 0.63 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 1987
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	27900	91054.1	4	4	4	36	48	35
2	11710	91090.6	4	4	4	36	48	42
3	26900	90944.6	4	4	4	35	48	42
4	27700	91081.4	4	4	4	37	48	42
5	30100	91017.6	4	4	4	37	48	42
6	29000	91035.8	4	4	4	39	48	42
7	27700	91090.6	4	4	4	38	48	33
8	27000	91172.6	4	4	4	37	48	37
9	27100	91081.4	4	4	4	35	48	25
10	27500	91063.2	4	4	4	36	48	27
11	27800	91090.6	4	4	4	37	48	26
12	27800	91099.7	4	4	4	42	36	33
13	26600	91081.4	4	4	4	42	42	20
14	28700	91108.8	4	4	4	42	42	9
15	27400	91136.2	4	4	4	42	42	10
16	26600	91108.8	4	4	4	42	37	29
17	26100	91072.3	4	4	4	43	39	34
18	26400	91127.0	4	4	4	48	39	35
19	28900	90990.2	4	4	4	48	39	33
20	28200	91099.7	4	4	4	48	39	35
21	27000	91136.2	4	4	4	48	33	34
22	27800	91108.8	4	4	4	48	32	32
23	29200	91136.2	4	4	4	48	39	29
24	28600	91099.7	4	4	4	47	39	18
25	29900	85500.0	4	4	4	48	39	0
26	26800	73388.6	4	4	4	42	17	0
27	27500	89977.9	4	4	4	48	34	3
28	28700	91108.8	4	4	4	48	35	12
29	27600	91108.8	4	4	4	48	37	22
30	25700	91117.9	4	4	4	48	35	23
31	26100	91090.6	4	4	4	48	33	15
AVERAGE	27162	90300.6	4	4	4	43	41	26

ASSUMPTIONS: Drift Rate = 0.0002%
TDS ppm = 0.48 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 1987
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	7596	10128	7385	2.16E+08	13392	589000	0.973	0.109
2	7596	10128	8862	2.16E+08	5621	589000	1.031	0.048
3	7385	10128	8862	2.16E+08	12912	589000	1.023	0.110
4	7807	10128	8862	2.16E+08	13296	589000	1.039	0.115
5	7807	10128	8862	2.16E+08	14448	589000	1.039	0.125
6	8229	10128	8862	2.16E+08	13920	589000	1.055	0.123
7	8018	10128	6963	2.16E+08	13296	589000	0.973	0.108
8	7807	10128	7807	2.16E+08	12960	589000	0.998	0.108
9	7385	10128	5275	2.16E+08	13008	589000	0.884	0.096
10	7596	10128	5697	2.16E+08	13200	589000	0.908	0.100
11	7807	10128	5486	2.16E+08	13344	589000	0.908	0.101
12	8862	7596	6963	2.16E+08	13344	589000	0.908	0.101
13	8862	8862	4220	2.16E+08	12768	589000	0.851	0.091
14	8862	8862	1899	2.16E+08	13776	589000	0.761	0.087
15	8862	8862	2110	2.16E+08	13152	589000	0.769	0.084
16	8862	7807	6119	2.16E+08	12768	589000	0.884	0.094
17	9073	8229	7174	2.16E+08	12528	589000	0.949	0.099
18	10128	8229	7385	2.16E+08	12672	589000	0.998	0.106
19	10128	8229	6963	2.16E+08	13872	589000	0.982	0.114
20	10128	8229	7385	2.16E+08	13536	589000	0.998	0.113
21	10128	6963	7174	2.16E+08	12960	589000	0.941	0.102
22	10128	6752	6752	2.16E+08	13344	589000	0.916	0.102
23	10128	8229	6119	2.16E+08	14016	589000	0.949	0.111
24	9917	8229	3798	2.16E+08	13728	589000	0.851	0.097
25	10128	8229	0	2.03E+08	14352	589000	0.712	0.085
26	8862	3587	0	1.74E+08	12864	589000	0.483	0.052
27	10128	7174	633	2.13E+08	13200	589000	0.695	0.077
28	10128	7385	2532	2.16E+08	13776	589000	0.777	0.089
29	10128	7807	4642	2.16E+08	13248	589000	0.875	0.097
30	10128	7385	4853	2.16E+08	12336	589000	0.867	0.089
31	10128	6963	3165	2.16E+08	12528	589000	0.785	0.082
AVERAGE	8991.32	8548.90	5574.48	2.14E+08	13037.57	589000	0.896	0.097

MPTIONS: Drift Rate = 0.0002%
TDS ppm = 0.48 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 1987
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	10230	17118.2	2	2	2	0	0	0
2	28600	21669.1	2	2	2	0	0	0
3	12290	21322.6	2	2	3	0	15	0
4	12710	21623.5	3	3	3	0	3	0
5	13800	10697.8	3	3	3	0	15	0
6	11480	6685.0	3	3	3	0	0	0
7	12660	9831.4	3	3	3	0	0	0
8	14100	23073.6	3	3	3	2	0	0
9	15000	40538.4	3	3	3	10	2	6
10	15200	49384.8	3	3	3	8	15	20
11	15800	49503.4	3	3	3	20	18	28
12	17500	48399.8	3	3	3	15	18	18
13	16700	46895.0	3	3	3	13	18	11
14	18800	47050.1	3	3	3	6	6	0
15	19200	46274.9	3	3	3	10	2	2
16	19900	47825.3	3	3	4	13	13	10
17	17000	46056.0	4	2	2	6	6	2
18	16100	118.6	2	2	2	0	0	0
19	17300	22827.4	2	2	3	3	3	3
20	9620	47269.0	4	4	4	19	18	18
21	17400	45581.8	4	4	4	21	19	18
22	18200	45600.0	4	4	4	20	20	15
23	19600	43967.5	4	4	4	21	19	9
24	19800	50907.8	4	4	4	21	18	2
25	19900	62289.6	4	4	4	23	24	11
26	19000	68427.4	4	4	4	24	30	12
27	21300	72595.2	4	4	4	26	45	12
28	21500	76060.8	4	4	4	29	45	14
29	22400	32585.8	4	4	4	11	15	7
30	19000	21869.8	3	2	3	3	4	2
31	22200	85728.0	3	3	3	32	32	18
AVERAGE	17235	39670.2	3	3	3	11	14	8

ASSUMPTIONS: Drift Rate = 0.0002%
TDS ppm = 0.48 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 1987
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	0	0	0	4.06E+07	4910	309000	0.000	0.000
2	0	0	0	5.14E+07	13728	309000	0.000	0.000
3	0	3165	0	5.05E+07	5899	355667	0.074	0.004
4	0	633	0	5.12E+07	6101	449000	0.019	0.001
5	0	3165	0	2.54E+07	6624	449000	0.094	0.005
6	0	0	0	1.58E+07	5510	449000	0.000	0.000
7	0	0	0	2.33E+07	6077	449000	0.000	0.000
8	422	0	0	5.47E+07	6768	449000	0.012	0.001
9	2110	422	1266	9.61E+07	7200	449000	0.112	0.007
10	1688	3165	4220	1.17E+08	7296	449000	0.268	0.016
11	4220	3798	5908	1.17E+08	7584	449000	0.412	0.026
12	3165	3798	3798	1.15E+08	8400	449000	0.318	0.022
13	2743	3798	2321	1.11E+08	8016	449000	0.262	0.018
14	1266	1266	0	1.12E+08	9024	449000	0.075	0.006
15	2110	422	422	1.10E+08	9216	449000	0.087	0.007
16	2743	2743	2110	1.13E+08	9552	495667	0.248	0.020
17	1266	1266	422	1.09E+08	8160	402333	0.078	0.005
18	0	0	0	2.81E+05	7728	309000	0.000	0.000
19	633	633	633	5.41E+07	8304	355667	0.044	0.003
20	4009	3798	3798	1.12E+08	4618	589000	0.450	0.017
21	4431	4009	3798	1.08E+08	8352	589000	0.474	0.033
22	4220	4220	3165	1.08E+08	8736	589000	0.450	0.033
23	4431	4009	1899	1.04E+08	9408	589000	0.401	0.031
24	4431	3798	422	1.21E+08	9504	589000	0.335	0.027
25	4853	5064	2321	1.48E+08	9552	589000	0.474	0.038
26	5064	6330	2532	1.62E+08	9120	589000	0.540	0.041
27	5486	9495	2532	1.72E+08	10224	589000	0.679	0.058
28	6119	9495	2954	1.80E+08	10320	589000	0.720	0.062
29	2321	3165	1477	7.72E+07	10752	589000	0.270	0.024
30	633	844	422	5.18E+07	9120	402333	0.050	0.004
31	6752	6752	3798	2.03E+08	10656	449000	0.511	0.045
AVERAGE	2423.10	2879.13	1619.94	9.40E+07	8272.88	473086	0.241	0.018

MPTIONS: Drift Rate = 0.0002%
TDS ppm = 0.48 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

Appendix B
Cooling Tower Basin Water

Cooling tower basin water samples are collected once per month from the cooling tower basins of operating PVNGS Units 1-3. Presented in this appendix are the data on 30 parameters for January through December 1987 for these units. 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

01/15/88

Lab Designation	8928-23474-2-1
Sponsor Designation	UNIT1
Cooling Tower	1
Sample Date	01-09-87

Determination (mg/l)	
Calcium, total	390
Magnesium, total	43.0
Sodium, total	5000
Chloride	4600
Sulfate (as SO4)	4400
Nitrate (as N)	270.0
Silica (as SiO2)	66
Phosphate	5.10
Fluoride	19.0
Potassium, total	260
Copper, total	0.070
Zinc, total	0.110
Iron, total	0.45
Arsenic, total	-0.050
Boron	8.4
Ammonium	1.6
TSS (at 105 Deg C)	29
COD	300
Alkalinity, total	36
TDS (at 180 Deg C)	16000
Silver, total	-0.005
Barium, total	-0.2
Cadmium, total	-0.005
Chromium, total	0.052
Lead, total	-0.050
Mercury, total	-0.0010
Beryllium, total	0.005
Selenium, total	-0.050
Manganese, total	0.022
Phenol	0.021
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

01/15/88

Lab Designation	8928-23474-2-2
Sponsor Designation	UNIT2
Cooling Tower	2
Sample Date	01-09-87

Determination (mg/l)	
Calcium, total	500
Magnesium, total	47.0
Sodium, total	5700
Chloride	6700
Sulfate (as SO4)	5800
Nitrate (as N)	310.0
Silica (as SiO2)	71
Phosphate	6.10
Fluoride	26.0
Potassium, total	310
Copper, total	0.120
Zinc, total	0.075
Iron, total	0.63
Arsenic, total	-0.050
Boron	4.0
Ammonium	0.4
TSS (at 105 Deg C)	51
COD	340
Alkalinity, total	62
TDS (at 180 Deg C)	21000
Silver, total	-0.005
Barium, total	-0.2
Cadmium, total	-0.005
Chromium, total	0.061
Lead, total	-0.050
Mercury, total	0.0010
Beryllium, total	0.007
Selenium, total	-0.050
Manganese, total	0.026
Phenol	0.008
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

01/15/88

Lab Designation	9999-99999-9-9
Sponsor Designation	UNIT1
Cooling Tower	1
Sample Date	02-14-87

Determination (mg/l)	
Calcium, total	999
Magnesium, total	999.9
Sodium, total	9999
Chloride	9999
Sulfate (as SO_4)	9999
Nitrate (as N)	999.9
Silica (as SiO_2)	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	999
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

01/15/88

Lab Designation	9999-99999-9-9
Sponsor Designation	UNIT2
Cooling Tower	2
Sample Date	02-14-87

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	999
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

01/15/88

Lab Designation	8928-23967-2-1
Sponsor Designation	UNIT1
Cooling Tower	1
Sample Date	03-31-87

Determination (mg/l)	
Calcium, total	330
Magnesium, total	43.0
Sodium, total	4500
Chloride	3800
Sulfate (as SO4)	4500
Nitrate (as N)	170.0
Silica (as SiO2)	39
Phosphate	4.50
Fluoride	16.0
Potassium, total	170
Copper, total	0.095
Zinc, total	0.120
Iron, total	0.37
Arsenic, total	0.031
Boron	5.3
Ammonium	0.4
TSS (at 105 Deg C)	56
COD	230
Alkalinity, total	79
TDS (at 180 Deg C)	13000
Silver, total	-0.005
Barium, total	-0.2
Cadmium, total	-0.005
Chromium, total	0.042
Lead, total	-0.050
Mercury, total	0.0003
Beryllium, total	-0.005
Selenium, total	-0.050
Manganese, total	0.023
Phenol	0.017
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

01/15/88

Lab Designation	8928-23967-2-2
Sponsor Designation	UNIT2
Cooling Tower	2
Sample Date	03-31-87

Determination (mg/l)

Calcium, total	250
Magnesium, total	32.0
Sodium, total	3300
Chloride	3200
Sulfate (as SO4)	3400
Nitrate (as N)	130.0
Silica (as SiO2)	27
Phosphate	3.30
Fluoride	13.0
Potassium, total	120
Copper, total	0.370
Zinc, total	0.084
Iron, total	0.98
Arsenic, total	0.017
Boron	4.4
Ammonium	0.4
TSS (at 105 Deg C)	28
COD	160
Alkalinity, total	100
TDS (at 180 Deg C)	10000
Silver, total	-0.005
Barium, total	-0.2
Cadmium, total	-0.005
Chromium, total	0.031
Lead, total	-0.050
Mercury, total	0.0001
Beryllium, total	-0.005
Selenium, total	-0.050
Manganese, total	0.031
Phenol	0.014
Conductivity mmhos/cm	15000

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

01/15/88

Lab Designation	8928-24139-2-1
Sponsor Designation	UNIT1
Cooling Tower	1
Sample Date	04-23-87

Determination (mg/l)	
Calcium, total	230
Magnesium, total	33.0
Sodium, total	3400
Chloride	3400
Sulfate (as SO4)	4500
Nitrate (as N)	170.0
Silica (as SiO2)	60
Phosphate	5.70
Fluoride	14.0
Potassium, total	160
Copper, total	0.055
Zinc, total	0.063
Iron, total	0.44
Arsenic, total	0.016
Boron	4.3
Ammonium	0.8
TSS (at 105 Deg C)	52
COD	320
Alkalinity, total	94
TDS (at 180 Deg C)	11000
Silver, total	0.017
Barium, total	-0.2
Cadmium, total	-0.005
Chromium, total	0.024
Lead, total	-0.050
Mercury, total	0.0002
Beryllium, total	-0.005
Selenium, total	-0.100
Manganese, total	0.018
Phenol	0.006
Conductivity mmhos/cm	19000

ARIZONA PUBLIC SERVICE

Cooling Tower Basin Water Sample Data

01/15/88

Lab Designation	8928-24139-2-2
Sponsor Designation	UNIT2
Cooling Tower	2
Sample Date	04-23-87

Determination (mg/l)	
Calcium, total	210
Magnesium, total	31.0
Sodium, total	3200
Chloride	3600
Sulfate (as SO4)	4100
Nitrate (as N)	130.0
Silica (as SiO2)	61
Phosphate	4.50
Fluoride	16.0
Potassium, total	150
Copper, total	0.068
Zinc, total	0.058
Iron, total	0.70
Arsenic, total	0.016
Boron	4.2
Ammonium	1.6
TSS (at 105 Deg C)	120
COD	280
Alkalinity, total	88
TDS (at 180 Deg C)	11000
Silver, total	0.014
Barium, total	-0.2
Cadmium, total	-0.005
Chromium, total	0.023
Lead, total	-0.050
Mercury, total	0.0002
Beryllium, total	-0.005
Selenium, total	-0.100
Manganese, total	0.029
Phenol	0.017
Conductivity mmhos/cm	17000

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

01/15/88

Lab Designation	8928-24295-2-1
Sponsor Designation	UNIT1
Cooling Tower	1
Sample Date	05-12-87

Determination (mg/l)	
Calcium, total	270
Magnesium, total	27.0
Sodium, total	4100
Chloride	4000
Sulfate (as SO4)	3400
Nitrate (as N)	240.0
Silica (as SiO2)	11
Phosphate	2.60
Fluoride	13.0
Potassium, total	190
Copper, total	0.099
Zinc, total	0.110
Iron, total	0.50
Arsenic, total	0.014
Boron	4.2
Ammonium	3.4
TSS (at 105 Deg C)	51
COD	360
Alkalinity, total	55
TDS (at 180 Deg C)	12000
Silver, total	-0.005
Barium, total	-0.2
Cadmium, total	-0.005
Chromium, total	0.018
Lead, total	0.060
Mercury, total	0.0012
Beryllium, total	-0.005
Selenium, total	-0.050
Manganese, total	0.024
Phenol	0.029
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

01/15/88

Lab Designation	8928-24295-2-2
Sponsor Designation	UNIT2
Cooling Tower	2
Sample Date	05-12-87

Determination (mg/l)	
Calcium, total	400
Magnesium, total	38.0
Sodium, total	5500
Chloride	6300
Sulfate (as SO4)	5200
Nitrate (as N)	310.0
Silica (as SiO2)	9
Phosphate	3.90
Fluoride	22.0
Potassium, total	180
Copper, total	0.200
Zinc, total	0.180
Iron, total	0.50
Arsenic, total	-0.050
Boron	5.8
Ammonium	0.6
TSS (at 105 Deg C)	39
COD	460
Alkalinity, total	33
TDS (at 180 Deg C)	17000
Silver, total	-0.005
Barium, total	-0.2
Cadmium, total	-0.005
Chromium, total	0.030
Lead, total	0.180
Mercury, total	0.0018
Beryllium, total	-0.005
Selenium, total	-0.050
Manganese, total	0.033
Phenol	0.019
Conductivity mmhos/cm	26000

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Cooling Tower Basin Water Sample Data

01/15/88

Lab Designation	8928-24622-2-1
Sponsor Designation	UNIT1
Cooling Tower	1
Sample Date	06-23-87

Determination (mg/l)	
Calcium, total	290
Magnesium, total	38.0
Sodium, total	4900
Chloride	4300
Sulfate (as SO4)	3800
Nitrate (as N)	180.0
Silica (as SiO2)	64
Phosphate	2.20
Fluoride	15.0
Potassium, total	230
Copper, total	0.093
Zinc, total	0.053
Iron, total	0.27
Arsenic, total	0.015
Boron	1.8
Ammonium	0.3
TSS (at 105 Deg C)	31
COD	290
Alkalinity, total	44
TDS (at 180 Deg C)	13000
Silver, total	-0.005
Barium, total	-0.2
Cadmium, total	-0.005
Chromium, total	0.034
Lead, total	-0.050
Mercury, total	-0.0001
Beryllium, total	-0.005
Selenium, total	-0.050
Manganese, total	0.160
Phenol	0.012
Conductivity mmhos/cm	17000

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

01/15/88

Lab Designation	8928-24622-2-2
Sponsor Designation	UNIT2
Cooling Tower	2
Sample Date	06-23-87

Determination (mg/l)	
Calcium, total	220
Magnesium, total	33.0
Sodium, total	4600
Chloride	3700
Sulfate (as SO4)	3100
Nitrate (as N)	160.0
Silica (as SiO2)	62
Phosphate	1.70
Fluoride	13.0
Potassium, total	200
Copper, total	0.076
Zinc, total	0.061
Iron, total	0.28
Arsenic, total	0.014
Boron	5.3
Ammonium	0.3
TSS (at 105 Deg C)	24
COD	240
Alkalinity, total	31
TDS (at 180 Deg C)	11000
Silver, total	-0.005
Barium, total	-0.2
Cadmium, total	-0.005
Chromium, total	0.026
Lead, total	-0.050
Mercury, total	-0.0001
Beryllium, total	-0.005
Selenium, total	-0.050
Manganese, total	0.009
Phenol	0.017
Conductivity mmhos/cm	16000

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

01/15/88

Lab Designation	8928-24957-2-1
Sponsor Designation	UNIT1
Cooling Tower	1
Sample Date	08-03-87

Determination (mg/l)	
Calcium, total	410
Magnesium, total	51.0
Sodium, total	6400
Chloride	6300
Sulfate (as SO4)	6100
Nitrate (as N)	290.0
Silica (as SiO2)	34
Phosphate	2.40
Fluoride	22.0
Potassium, total	210
Copper, total	0.130
Zinc, total	0.220
Iron, total	0.77
Arsenic, total	0.019
Boron	9.4
Ammonium	0.8
TSS (at 105 Deg C)	57
COD	250
Alkalinity, total	26
TDS (at 180 Deg C)	18000
Silver, total	0.060
Barium, total	-0.2
Cadmium, total	-0.025
Chromium, total	-0.025
Lead, total	-0.005
Mercury, total	-0.0001
Beryllium, total	-0.025
Selenium, total	-0.050
Manganese, total	0.035
Phenol	0.011
Conductivity mmhos/cm	26000

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

01/15/88

Lab Designation	8928-24957-2-2
Sponsor Designation	UNIT2
Cooling Tower	2
Sample Date	08-03-87

Determination (mg/l)	
Calcium, total	360
Magnesium, total	41.0
Sodium, total	5900
Chloride	6200
Sulfate (as SO4)	5400
Nitrate (as N)	230.0
Silica (as SiO2)	31
Phosphate	1.50
Fluoride	21.0
Potassium, total	170
Copper, total	0.080
Zinc, total	0.110
Iron, total	0.43
Arsenic, total	0.015
Boron	8.9
Ammonium	0.5
TSS (at 105 Deg C)	72
COD	310
Alkalinity, total	31
TDS (at 180 Deg C)	18000
Silver, total	0.050
Barium, total	-0.2
Cadmium, total	-0.025
Chromium, total	0.030
Lead, total	-0.005
Mercury, total	-0.0001
Beryllium, total	-0.025
Selenium, total	-0.050
Manganese, total	-0.025
Phenol	0.007
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

01/15/88

Lab Designation	8928-25110-2-1
Sponsor Designation	UNIT1
Cooling Tower	1
Sample Date	08-20-87

Determination (mg/l)	
Calcium, total	490
Magnesium, total	51.0
Sodium, total	6000
Chloride	6300
Sulfate (as SO4)	5700
Nitrate (as N)	190.0
Silica (as SiO2)	31
Phosphate	2.70
Fluoride	24.0
Potassium, total	110
Copper, total	0.160
Zinc, total	0.20Q
Iron, total	0.48
Arsenic, total	0.016
Boron	9.5
Ammonium	8.0
TSS (at 105 Deg C)	47
COD	350
Alkalinity, total	8
TDS (at 180 Deg C)	19000
Silver, total	-0.005
Barium, total	0.2
Cadmium, total	-0.005
Chromium, total	0.022
Lead, total	-0.050
Mercury, total	-0.0001
Beryllium, total	-0.005
Selenium, total	-0.050
Manganese, total	0.039
Phenol	0.015
Conductivity mmhos/cm	18000

ARIZONA PUBLIC SERVICE

Cooling Tower Basin Water Sample Data

01/15/88

Lab Designation	8928-25110-2-2
Sponsor Designation	UNIT2
Cooling Tower	2
Sample Date	08-20-87

Determination (mg/l)	
Calcium, total	430
Magnesium, total	45.0
Sodium, total	5800
Chloride	6100
Sulfate (as SO4)	5200
Nitrate (as N)	170.0
Silica (as SiO2)	4
Phosphate	2.30
Fluoride	23.0
Potassium, total	130
Copper, total	0.097
Zinc, total	0.056
Iron, total	0.43
Arsenic, total	0.014
Boron	8.3
Ammonium	4.7
TSS (at 105 Deg C)	80
COD	350
Alkalinity, total	36
TDS (at 180 Deg C)	16000
Silver, total	-0.005
Barium, total	0.2
Cadmium, total	0.013
Chromium, total	0.021
Lead, total	-0.050
Mercury, total	-0.0001
Beryllium, total	-0.005
Selenium, total	-0.050
Manganese, total	0.025
Phenol	0.020
Conductivity mmhos/cm	17000

ARIZONA PUBLIC SERVICE

Cooling Tower Basin Water Sample Data

01/15/88

Lab Designation	8928-25380-2-1
Sponsor Designation	UNIT1
Cooling Tower	1
Sample Date	09-22-87

Determination (mg/l)	
Calcium, total	470
Magnesium, total	50.0
Sodium, total	6000
Chloride	6300
Sulfate (as SO4)	5300
Nitrate (as N)	220.0
Silica (as SiO2)	49
Phosphate	3.50
Fluoride	20.0
Potassium, total	91
Copper, total	0.130
Zinc, total	0.200
Iron, total	0.54
Arsenic, total	0.015
Boron	8.7
Ammonium	0.6
TSS (at 105 Deg C)	61
COD	290
Alkalinity, total	26
TDS (at 180 Deg C)	17000
Silver, total	-0.005
Barium, total	0.2
Cadmium, total	-0.005
Chromium, total	0.029
Lead, total	-0.050
Mercury, total	-0.0001
Beryllium, total	-0.005
Selenium, total	-0.050
Manganese, total	0.021
Phenol	0.007
Conductivity mmhos/cm.	19000

ARIZONA PUBLIC SERVICE

Cooling Tower Basin Water Sample Data

01/15/88

Lab Designation	8928-25380-2-2
Sponsor Designation	UNIT2
Cooling Tower	2
Sample Date	09-22-87

Determination (mg/l)	
Calcium, total	470
Magnesium, total	50.0
Sodium, total	5300
Chloride	6400
Sulfate (as SO4)	5200
Nitrate (as N)	230.0
Silica (as SiO2)	46
Phosphate	2.30
Fluoride	21.0
Potassium, total	86
Copper, total	0.110
Zinc, total	0.061
Iron, total	0.58
Arsenic, total	0.015
Boron	8.7
Ammonium	0.5
TSS (at 105 Deg C)	61
COD	130
Alkalinity, total	31
TDS (at 180 Deg C)	18000
Silver, total	-0.005
Barium, total	0.3
Cadmium, total	-0.005
Chromium, total	0.029
Lead, total	-0.050
Mercury, total	-0.0001
Beryllium, total	-0.005
Selenium, total	-0.050
Manganese, total	0.019
Phenol	0.008
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

01/15/88

Lab Designation	8928-25587-2-1
Sponsor Designation	UNIT1
Cooling Tower	1
Sample Date	10-15-87

Determination (mg/l)	
Calcium, total	430
Magnesium, total	45.0
Sodium, total	7000
Chloride	7300
Sulfate (as SO_4)	6000
Nitrate (as N)	230.0
Silica (as SiO_2)	40
Phosphate	2.10
Fluoride	29.0
Potassium, total	110
Copper, total	0.240
Zinc, total	0.490
Iron, total	1.10
Arsenic, total	-0.050
Boron	10.0
Ammonium	0.4
TSS (at 105 Deg C)	84
COD	150
Alkalinity, total	55
TDS (at 180 Deg C)	21000
Silver, total	-0.005
Barium, total	0.3
Cadmium, total	-0.005
Chromium, total	0.061
Lead, total	-0.050
Mercury, total	0.0002
Beryllium, total	-0.005
Selenium, total	-0.050
Manganese, total	0.043
Phenol	0.006
Conductivity mmhos/cm	29000

ARIZONA PUBLIC SERVICE

Cooling Tower Basin Water Sample Data

01/15/88

Lab Designation	8928-25587-2-2
Sponsor Designation	UNIT2
Cooling Tower	2
Sample Date	10-15-87

Determination (mg/l)	
Calcium, total	450
Magnesium, total	41.0
Sodium, total	7900
Chloride	8100
Sulfate (as SO4)	7100
Nitrate (as N)	270.0
Silica (as SiO2)	32
Phosphate	1.90
Fluoride	32.0
Potassium, total	110
Copper, total	0.120
Zinc, total	0.190
Iron, total	1.00
Arsenic, total	-0.050
Boron	11.0
Ammonium	1.2
TSS (at 105 Deg C)	170
COD	300
Alkalinity, total	25
TDS (at 180 Deg C)	23000
Silver, total	-0.005
Barium, total	0.3
Cadmium, total	-0.005
Chromium, total	0.059
Lead, total	-0.050
Mercury, total	-0.0010
Beryllium, total	-0.005
Selenium, total	-0.050
Manganese, total	0.039
Phenol	0.009
Conductivity mmhos/cm	31000

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

01/15/88

Lab Designation	8928-25820-1-1
Sponsor Designation	UNIT1
Cooling Tower	1
Sample Date	11-16-87

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	999
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

01/15/88

Lab Designation	8928-25820-1-1
Sponsor Designation	UNIT2
Cooling Tower	2
Sample Date	11-16-87

Determination (mg/l)	
Calcium, total	160
Magnesium, total	11.0
Sodium, total	1600
Chloride	1900
Sulfate (as SO4)	1500
Nitrate (as N)	50.0
Silica (as SiO2)	15
Phosphate	0.41
Fluoride	6.3
Potassium, total	67
Copper, total	0.380
Zinc, total	0.110
Iron, total	0.39
Arsenic, total	0.007
Boron	2.4
Ammonium	-0.2
TSS (at 105 Deg C)	13
COD	32.
Alkalinity, total	13
TDS (at 180 Deg C)	5000
Silver, total	-0.005
Barium, total	-0.2
Cadmium, total	-0.005
Chromium, total	0.024
Lead, total	-0.005
Mercury, total	-0.0001
Beryllium, total	-0.005
Selenium, total	-0.050
Manganese, total	0.019
Phenol	-0.002
Conductivity mmhos/cm	7900

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

01/15/88

Lab Designation	8928-26043-2-3
Sponsor Designation	UNIT1
Cooling Tower	1
Sample Date	12-17-87

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	999
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

01/15/88

Lab Designation	8928-26043-2-1
Sponsor Designation	UNIT2
Cooling Tower	2
Sample Date	12-17-87

Determination (mg/l)	
Calcium, total	400
Magnesium, total	49.0
Sodium, total	7500
Chloride	7400
Sulfate (as SO4)	6700
Nitrate (as N)	220.0
Silica (as SiO2)	44
Phosphate	2.90
Fluoride	27.0
Potassium, total	380
Copper, total	0.120
Zinc, total	0.110
Iron, total	0.55
Arsenic, total	-0.005
Boron	10.0
Ammonium	0.5
TSS (at 105 Deg C)	42
COD	780
Alkalinity, total	39
TDS (at 180 Deg C)	18000
Silver, total	0.040
Barium, total	0.1
Cadmium, total	0.008
Chromium, total	0.035
Lead, total	-0.025
Mercury, total	0.0003
Beryllium, total	-0.005
Selenium, total	0.035
Manganese, total	0.110
Phenol	0.007
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

01/15/88

Lab Designation	8928-26043-2-2
Sponsor Designation	UNIT3
Cooling Tower	3
Sample Date	12-17-87

Determination (mg/l)	
Calcium, total	280
Magnesium, total	30.0
Sodium, total	4700
Chloride	5200
Sulfate (as SO4)	3900
Nitrate (as N)	140.0
Silica (as SiO2)	30
Phosphate	1.50
Fluoride	18.0
Potassium, total	240
Copper, total	0.670
Zinc, total	0.100
Iron, total	1.20
Arsenic, total	0.011
Boron	6.4
Ammonium	0.4
TSS (at 105 Deg C)	37
COD	180
Alkalinity, total	22
TDS (at 180 Deg C)	14000
Silver, total	0.012
Barium, total	0.1
Cadmium, total	-0.005
Chromium, total	0.030
Lead, total	-0.025
Mercury, total	0.0001
Beryllium, total	-0.005
Selenium, total	-0.005
Manganese, total	0.110
Phenol	0.006
Conductivity mmhos/cm	27000

APPENDIX C

DUSTFALL DATA

Appendix C

Dustfall Data

This appendix presents all the airborne salt drift deposition data obtained during the period January through December 1987 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 Wheat Ridge, 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.

Copper sulfate was added to the sample collection water as a algicide from May 1983 through May 1987. This practice was discontinued in June 1987. Sulfate values for the period prior to June 1987 do not represent actual deposition rates, since the added sulfate dominates this measurement.

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 4 occasions in which neither sample at a location produced valid data. There were also 11 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 1987 through December 1987 was 98.4 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 1-87

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	1.173	0.19	0.427	0.01	0.748	0.23	0.118	0.02	1.171	0.61	0.534	0.01	25.592	3.72	0.192	0.08
002	1.034	0.23	0.460	0.00	0.804	0.69	0.057	0.00	0.632	0.57	0.575	0.00	26.435	6.83	0.184	0.09
003	1.361	0.36	0.464	0.49	0.684	0.05	0.057	0.00	0.947	1.19	0.570	0.04	28.394	4.81	0.129	0.14
004	0.702	0.19	0.400	0.40	0.903	0.19	0.050	0.00	0.554	0.51	0.502	0.01	25.125	6.37	0.075	0.05
005	0.687	0.16	0.389	0.37	0.592	0.03	0.049	0.00	0.549	0.52	0.493	0.03	25.694	5.39	0.159	0.09
006	0.809	0.04	0.508	0.23	0.809	0.04	0.051	0.00	0.549	0.47	0.506	0.03	25.194	4.68	0.131	0.01
007	0.607	0.06	0.607	0.06	1.427	0.53	0.257	0.21	0.449	0.26	0.506	0.05	26.142	5.72	0.075	0.04
008	0.710	0.20	0.304	0.20	0.609	0.00	0.051	0.00	0.457	0.31	0.508	0.00	18.273	0.10	0.122	0.00
009	0.957	0.02	0.239	0.01	0.478	0.01	0.060	0.00	0.536	0.35	0.598	0.01	23.913	0.52	0.131	0.02
010	1.036	0.22	0.346	0.23	0.691	0.00	0.115	0.00	0.806	0.23	0.575	0.00	24.167	2.18	0.161	0.00
011	1.219	0.01	1.066	0.30	2.438	0.01	0.701	0.25	0.457	0.00	0.762	0.00	24.379	0.13	0.183	0.00
012	0.969	0.67	0.863	0.88	1.073	0.02	0.226	0.07	0.322	0.01	0.536	0.01	19.310	0.43	0.161	0.03
013	0.535	0.23	0.426	0.01	0.955	0.61	0.180	0.10	0.320	0.01	0.533	0.02	17.057	0.51	0.128	0.00
014	1.650	0.16	0.236	0.02	1.526	0.09	0.235	0.02	1.291	0.11	0.589	0.06	25.924	2.48	0.186	0.08
015	0.542	0.21	0.432	0.42	0.654	0.45	0.054	0.00	0.326	0.01	0.543	0.01	21.723	0.48	0.054	0.00
016	3.270	0.45	0.635	0.04	0.949	0.16	0.079	0.05	2.750	0.15	0.529	0.03	27.503	1.54	0.297	0.06
017	0.571	0.21	0.458	0.01	0.799	0.21	0.057	0.00	0.343	0.01	0.572	0.02	25.179	0.73	0.057	0.00
018	0.545	0.17	0.325	0.19	0.660	0.06	0.055	0.00	0.330	0.03	0.550	0.05	24.189	2.05	0.055	0.00
019	0.817	0.18	0.583	0.20	0.704	0.04	0.059	0.00	0.352	0.02	0.586	0.04	25.806	1.58	0.059	0.00
020	2.078	0.12	0.581	0.26	0.924	0.05	0.058	0.00	1.735	0.33	0.577	0.03	27.712	1.58	0.220	0.04
02	0.737	0.16	0.635	0.04	0.635	0.04	0.053	0.00	0.318	0.02	0.529	0.04	23.211	2.64	0.089	0.07
022	0.733	0.24	0.418	0.02	0.729	0.18	0.052	0.00	0.313	0.01	0.522	0.02	22.978	0.86	0.115	0.03
023	1.073	0.14	1.187	0.37	4.281	1.04	0.825	0.00	0.548	0.41	0.599	0.06	25.113	0.07	0.156	0.04
024	0.563	0.22	0.563	0.22	0.676	0.00	0.107	0.10	0.338	0.00	0.563	0.00	23.654	2.19	0.135	0.04
025	0.595	0.01	0.494	0.19	1.091	0.22	0.208	0.02	0.297	0.01	0.496	0.01	17.839	0.39	0.178	0.04
026	0.526	0.24	0.418	0.02	0.526	0.24	0.052	0.00	0.314	0.02	0.523	0.03	16.908	13.48	0.078	0.05
027	0.502	0.21	0.600	0.39	0.902	0.19	0.110	0.02	0.301	0.00	0.501	0.01	24.067	0.40	0.130	0.02
028	0.577	0.25	0.342	0.22	0.689	0.03	0.057	0.00	0.345	0.01	0.574	0.02	26.403	1.19	0.057	0.00
030	1.080	999.99	1.296	999.99	1.080	999.99	0.130	999.99	0.324	999.99	0.540	999.99	28.080	999.99	0.130	999.99
031	0.946	0.22	0.420	0.00	0.944	0.20	0.089	0.07	0.473	0.32	0.525	0.01	25.200	0.27	0.199	0.02
032	0.702	0.33	0.810	0.55	0.594	0.11	0.092	0.08	0.243	0.16	0.405	0.27	17.825	12.02	0.113	0.08
033	0.448	0.34	0.448	0.34	0.448	0.34	0.037	0.03	0.224	0.17	0.373	0.28	17.443	14.45	0.100	0.09
034	0.509	0.17	0.410	0.03	0.607	0.36	0.051	0.00	0.307	0.02	0.512	0.04	24.600	1.87	0.133	0.01
035	0.467	0.03	0.587	0.27	0.814	0.18	0.098	0.08	0.350	0.02	0.584	0.03	24.494	0.88	0.098	0.08
036	0.418	0.01	0.416	0.41	0.522	0.20	0.052	0.00	0.314	0.01	0.523	0.01	24.042	1.52	0.099	0.09
037	1.131	1.37	0.451	0.01	0.564	0.23	0.056	0.00	0.338	0.00	0.563	0.01	24.781	0.31	0.084	0.06
038	0.541	0.21	0.542	0.22	0.758	0.22	0.054	0.00	0.325	0.00	0.541	0.00	27.078	2.32	0.054	0.00
039	0.418	0.02	0.418	0.02	0.626	0.04	0.052	0.00	0.313	0.02	0.522	0.03	26.070	0.59	0.052	0.00
040	0.643	0.01	0.429	0.00	0.643	0.01	0.139	0.02	0.321	0.00	0.536	0.01	18.209	1.96	0.118	0.02
041	0.852	0.00	0.745	0.64	0.639	0.00	0.080	0.05	0.746	0.22	0.533	0.00	26.633	2.20	0.160	0.02
042	0.331	0.21	1.230	1.15	0.666	0.02	0.055	0.00	0.333	0.01	0.555	0.02	27.732	1.32	0.144	0.06
043	0.559	0.21	0.556	0.66	0.787	0.25	0.056	0.00	0.337	0.01	0.561	0.02	26.928	0.72	0.146	0.03
044	0.640	0.03	0.536	0.24	0.426	0.02	0.053	0.00	0.320	0.02	0.533	0.03	20.229	1.11	0.100	0.09
045	0.696	0.02	0.464	0.01	1.042	0.20	0.058	0.00	0.348	0.01	0.580	0.02	26.652	1.56	0.058	0.00
080	3.764	0.71	0.386	0.01	1.251	0.15	0.145	0.02	3.565	0.07	0.482	0.02	27.936	0.96	0.288	0.11
08	8.395	2.56	0.646	0.00	1.507	0.00	0.183	0.02	7.965	1.70	0.538	0.00	32.297	0.09	0.495	0.13
082	2.171	2.02	0.392	0.01	0.981	0.03	0.118	0.00	0.981	0.03	0.490	0.01	24.500	1.27	0.147	0.02
083	10.405	1.45	0.718	0.18	1.747	0.14	0.268	0.09	10.594	0.19	0.515	0.02	33.983	3.43	0.680	0.07
Ar.Mean	1.285	0.33	0.548	0.22	0.929	0.17	0.123	0.03	0.966	0.20	0.539	0.03	24.429	2.59	0.148	0.04
Std.Dev.	1.848	0.51	0.238	0.25	0.618	0.21	0.149	0.05	1.878	0.33	0.054	0.05	3.723	3.32	0.110	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 1-87

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

Location Number	PO4	d	CO3	d	HCO3	d	NH4	d	TSS	d	CU	d	Av d	SD(d)
001	0.021	0.00	5.337	0.12	9.032	7.27	0.213	0.00	8.034	5.51	13.556	0.51	1.31	2.38
002	0.023	0.00	5.748	0.01	9.766	8.02	0.230	0.00	5.748	0.01	14.483	0.88	1.24	2.65
003	0.023	0.00	5.703	0.41	9.553	7.29	0.228	0.02	13.606	3.59	14.127	0.10	1.32	2.27
004	0.020	0.00	5.021	0.07	5.021	0.07	0.201	0.00	8.560	7.15	13.758	0.39	1.10	2.41
005	0.020	0.00	4.931	0.28	8.479	7.37	0.197	0.01	8.479	7.37	12.526	0.90	1.61	2.81
006	0.020	0.00	5.056	0.28	12.133	0.67	0.202	0.01	5.056	0.28	13.959	1.17	0.57	1.23
007	0.020	0.00	5.062	0.46	8.446	6.31	0.202	0.02	20.617	18.03	13.839	0.16	2.28	5.00
008	0.020	0.00	5.076	0.03	8.620	7.06	0.203	0.00	5.076	0.03	10.660	0.67	0.61	1.86
009	0.024	0.00	5.978	0.13	5.978	0.13	0.239	0.01	9.000	6.17	14.101	1.13	0.61	1.63
010	0.023	0.00	5.755	0.03	5.755	0.03	0.230	0.00	9.773	8.01	14.386	1.08	0.86	2.15
011	0.076	0.03	7.618	0.04	12.965	10.73	0.305	0.00	54.916	49.04	15.541	0.53	4.36	13.17
012	0.021	0.00	5.364	0.12	5.364	0.12	0.215	0.00	14.995	3.95	11.268	0.90	0.52	1.04
013	0.021	0.00	5.330	0.16	5.330	0.16	0.213	0.01	5.330	0.16	10.667	1.17	0.23	0.33
014	0.024	0.00	5.892	0.56	10.213	9.20	0.236	0.02	5.892	0.56	14.937	0.25	0.97	2.46
015	0.022	0.00	5.431	0.12	5.431	0.12	0.217	0.00	5.431	0.12	13.693	1.61	0.25	0.43
016	0.021	0.00	5.289	0.30	5.289	0.30	0.212	0.01	5.289	0.30	14.483	0.18	0.25	0.40
017	0.023	0.00	5.722	0.16	5.722	0.16	0.229	0.01	5.722	0.16	14.766	0.65	0.17	0.24
018	0.022	0.00	5.497	0.46	5.497	0.46	0.220	0.02	5.497	0.46	13.978	1.84	0.41	0.67
019	0.023	0.00	5.865	0.36	5.865	0.36	0.235	0.01	5.865	0.36	14.289	0.53	0.26	0.42
020	0.023	0.00	5.773	0.33	9.700	7.52	0.231	0.01	8.742	6.27	14.905	1.54	1.29	[illegible]
021	0.021	0.00	5.292	0.36	9.122	8.02	0.212	0.01	5.292	0.36	14.277	0.34	0.87	[illegible]
022	0.021	0.00	5.222	0.19	8.946	7.64	0.209	0.01	14.960	19.28	13.050	0.14	2.04	[illegible]
023	0.060	0.03	5.992	0.55	14.382	1.33	0.240	0.02	75.672	14.18	13.456	2.68	1.49	3.73
024	0.023	0.00	5.632	0.01	5.632	0.01	0.225	0.00	12.945	14.61	14.193	0.04	1.25	3.89
025	0.020	0.00	4.955	0.11	8.387	6.76	0.198	0.00	18.863	6.35	11.194	0.75	1.06	2.34
026	0.021	0.00	5.229	0.29	5.229	0.29	0.209	0.01	9.804	8.86	10.630	5.40	2.07	4.21
027	0.020	0.00	5.014	0.08	8.494	6.88	0.201	0.00	5.014	0.08	14.244	1.44	0.69	1.82
028	0.023	0.00	5.745	0.24	5.745	0.24	0.230	0.01	8.677	6.10	15.064	1.78	0.72	1.64
030	0.454	999.99	5.400	999.99	12.960	999.99	0.864	999.99	5.400	999.99	13.824	999.99	999.99	999.99
031	0.021	0.00	5.250	0.06	8.906	7.26	0.210	0.00	5.250	0.06	13.963	0.48	0.64	1.91
032	0.038	0.05	4.051	2.73	4.051	2.73	0.162	0.11	4.051	2.73	9.939	6.99	2.07	3.47
033	0.015	0.01	3.731	2.82	8.954	6.76	0.149	0.11	3.731	2.82	9.644	7.02	2.54	4.20
034	0.020	0.00	5.125	0.39	12.300	0.93	0.205	0.02	5.125	0.39	13.712	0.19	0.32	0.52
035	0.023	0.00	5.840	0.35	9.807	7.59	0.234	0.01	5.840	0.35	13.783	0.82	0.76	1.98
036	0.052	0.06	5.229	0.13	12.550	0.30	0.209	0.00	5.229	0.13	14.002	1.76	0.33	0.57
037	0.023	0.00	5.632	0.07	5.632	0.07	0.225	0.00	5.632	0.07	13.966	0.28	0.18	0.36
038	0.022	0.00	5.415	0.03	12.996	0.07	0.217	0.00	5.415	0.03	14.513	0.51	0.26	0.61
039	0.021	0.00	5.220	0.30	12.528	0.72	0.209	0.01	5.220	0.30	13.888	1.01	0.22	0.33
040	0.021	0.00	5.357	0.05	9.088	7.41	0.214	0.00	5.357	0.05	10.177	0.54	0.72	2.00
041	0.021	0.00	5.326	0.01	12.783	0.03	0.213	0.00	5.326	0.01	13.956	1.10	0.31	0.63
042	0.022	0.00	5.550	0.18	13.320	0.43	0.222	0.01	5.550	0.18	14.972	1.07	0.33	0.48
043	0.022	0.00	5.610	0.15	13.464	0.36	0.224	0.01	5.610	0.15	13.685	0.08	0.19	0.24
044	0.021	0.00	5.330	0.27	5.330	0.27	0.213	0.01	5.330	0.27	10.885	1.40	0.27	0.44
045	0.023	0.00	5.797	0.17	13.914	0.40	0.232	0.01	5.797	0.17	14.737	2.04	0.33	0.64
080	0.019	0.00	4.819	0.17	11.567	0.40	0.193	0.01	4.819	0.17	13.004	0.51	0.24	[illegible]
081	0.022	0.00	5.383	0.02	9.145	7.51	0.215	0.00	5.383	0.02	13.780	0.47	0.89	[illegible]
082	0.020	0.00	4.903	0.14	15.053	20.16	0.196	0.01	7.319	4.69	13.728	0.39	2.06	5.37
083	0.021	0.00	5.146	0.21	12.350	0.50	0.206	0.01	5.146	0.21	13.266	0.49	0.50	0.92
Ar.Mean	0.033	0.00	5.388	0.31	9.100	3.58	0.229	0.01	9.779	4.26	13.405	1.19	0.93	2.09
Std.dev.	0.063	0.01	0.543	0.55	3.145	4.35	0.096	0.02	12.463	8.30	1.501	1.52	0.82	2.19

ARIZONA PUBLIC SERVICE
MONTHLY REPORT for 1-87

DEPOSITION DATA
Comments and Messages Only

Location Number	Sample A Comments	Sample B Comments	Processing Messages
001			
002			
003			
004			
005			
006	PAINT PIECES		
007			
008			
009			
010	PAINT CHIPS		
011	COTTON ON SCREEN	COTTON ON SCREEN.SITE MOVED 0.18 MILES SOUTH	
012	BIRD DROPPINGS ON SCREEN	BIRD DROPPINGS ON SCREEN	
013			
014			
015			
016			
017			
018			
019			
020			
021			
022			
023			
024	BIRD DROPPINGS AND INSECT PARTS		
025			
026		PAINT CHIPS	
027	BIRD DROPPINGS ON SCREEN	BIRD DROPPINGS ON SCREEN	
028			
030	VOID/CONTAMINATION	BIRD DROPPINGS ON SCREEN	MISSING SAMPLE A
031			
032			
033		SCREEN OFF MONITOR	
034			
035		LEAVES ON SCREEN	
036			
037			
038			
039			
040			
041			
042			
043	BIRD DROPPINGS ON SCREEN		
044			
045			
080	PLASTIC SHAVINGS		
081	PIECES OF PAINT AND TAPE		
082	PLASTIC SHAVINGS	BIRD DROPPINGS ON SCREEN	
083			

ARIZONA PUBLIC SERVICE
MONTHLY REPORT for 2-87

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

1

Location Number	Na	d	K	d	Ca	d	Mg	d	Cl	d	F	d	SO4	d	NO3	d
001	0.303	0.13	0.121	0.01	0.966	0.05	0.163	0.00	0.274	0.19	0.302	0.01	11.459	0.67	0.133	0.0
002	0.289	0.12	0.115	0.00	0.866	0.14	0.138	0.00	0.173	0.00	0.288	0.01	10.950	0.86	0.127	0.0
003	0.292	0.12	0.117	0.00	0.758	0.10	0.129	0.05	0.409	0.13	0.292	0.01	15.173	0.37	0.123	0.0
004	0.435	0.13	0.124	0.00	0.745	0.01	0.059	0.05	0.186	0.00	0.310	0.01	16.138	0.27	0.155	0.0
005	0.320	0.12	0.112	0.03	0.770	0.02	0.104	0.00	0.288	0.19	0.281	0.09	16.528	0.70	0.117	0.0
006	0.380	0.03	0.187	0.11	0.827	0.20	0.143	0.13	0.507	0.05	0.317	0.03	17.079	0.27	0.140	0.0
007	0.291	0.11	0.117	0.00	1.284	0.19	0.158	0.06	0.265	0.18	0.292	0.01	11.669	1.92	0.129	0.0
008	0.370	0.25	0.123	0.00	0.740	0.00	0.105	0.01	0.277	0.18	0.308	0.00	11.721	1.28	0.111	0.0
009	0.253	0.25	0.127	0.00	0.763	0.01	0.102	0.05	0.287	0.20	0.318	0.01	11.452	0.19	0.102	0.0
010	0.241	0.02	0.183	0.14	1.032	0.45	0.184	0.16	0.181	0.02	0.301	0.03	11.423	0.22	0.121	0.0
011	0.447	0.04	0.623	0.13	2.834	1.20	1.049	0.48	0.447	0.04	0.224	0.02	12.062	0.08	0.228	0.0
012	0.322	0.01	0.538	0.23	1.773	0.36	0.447	0.26	0.429	0.01	0.268	0.01	11.793	1.86	0.204	0.0
013	0.230	0.01	0.286	0.10	1.151	0.07	0.257	0.11	0.345	0.02	0.288	0.02	11.475	1.63	0.150	0.0
014	0.371	0.03	0.183	0.11	1.612	0.37	0.290	0.01	0.275	0.16	0.309	0.02	11.721	0.35	0.136	0.0
015	0.192	0.13	0.127	0.00	0.575	0.15	0.083	0.04	0.191	0.01	0.319	0.01	12.101	0.83	0.061	0.0
016	0.789	0.22	0.236	0.25	1.105	0.05	0.213	0.04	0.642	0.16	0.254	0.06	16.458	1.28	0.205	0.0
017	0.325	0.01	0.108	0.00	0.650	0.01	0.076	0.02	0.297	0.27	0.271	0.00	16.248	1.88	0.114	0.0
018	0.350	0.00	0.146	0.06	0.657	0.08	0.109	0.01	0.452	0.02	0.255	0.07	16.495	0.47	0.126	0.0
019	0.363	0.01	0.151	0.06	0.726	0.01	0.122	0.10	0.311	0.35	0.265	0.08	15.416	1.57	0.119	0.0
020	0.867	0.31	0.675	0.40	1.058	0.22	0.120	0.05	0.780	0.10	0.331	0.07	20.898	0.97	0.247	0.0
021	0.361	0.01	0.299	0.11	0.901	0.09	0.150	0.01	0.422	0.14	0.301	0.01	11.436	1.64	[illegible]	0.0
022	0.335	0.02	0.166	0.10	0.670	0.05	0.084	0.00	0.447	0.03	0.279	0.02	12.290	0.91	[illegible]	0.0
023	0.332	0.14	0.597	0.14	3.248	0.09	0.803	0.32	0.299	0.20	0.331	0.00	15.910	0.23	0.159	0.0
024	0.467	0.08	0.500	0.49	0.816	0.14	0.177	0.08	0.350	0.06	0.292	0.05	13.363	1.15	0.128	0.0
025	0.407	0.12	0.232	0.00	0.755	0.11	0.186	0.05	0.581	0.00	0.290	0.00	13.353	1.10	0.192	0.0
026	0.318	0.20	0.159	0.10	0.641	0.03	0.117	0.02	0.446	0.56	0.267	0.01	17.496	8.67	0.153	0.1
027	0.340	0.24	0.170	0.12	0.730	0.08	0.102	0.07	0.450	0.02	0.281	0.01	17.452	2.01	0.135	0.0
028	0.348	0.14	0.197	0.02	1.272	1.43	0.255	0.03	0.395	0.05	0.247	0.03	16.723	0.00	0.230	0.0
030	0.738	0.16	1.169	0.29	5.373	1.72	1.754	0.43	0.793	0.06	0.265	0.02	16.921	1.04	0.334	0.0
031	0.487	0.09	0.163	0.11	1.082	0.18	0.103	0.01	0.703	0.08	0.271	0.01	12.453	0.67	0.217	0.0
032	0.406	0.10	0.406	0.10	1.164	0.05	0.262	0.02	0.522	0.09	0.291	0.01	12.207	0.62	0.111	0.0
033	0.413	0.12	0.118	0.00	0.884	0.12	0.147	0.04	0.590	0.00	0.295	0.00	12.383	1.18	0.142	0.0
034	0.283	0.13	0.085	0.06	0.504	0.07	0.028	0.00	0.304	0.26	0.281	0.02	12.375	0.97	0.090	0.0
035	0.306	0.11	0.123	0.01	0.616	0.03	0.074	0.00	0.185	0.01	0.308	0.02	11.048	1.90	0.098	0.0
036	0.302	0.12	0.181	0.12	0.482	0.00	0.045	0.03	0.272	0.18	0.301	0.00	12.047	2.31	0.057	0.0
037	0.473	0.13	0.135	0.00	0.473	0.13	0.051	0.03	0.305	0.20	0.338	0.00	11.498	1.40	0.081	0.0
038	0.275	0.11	0.110	0.00	0.604	0.12	0.066	0.00	0.358	0.39	0.275	0.00	16.481	2.34	0.110	0.0
039	0.245	0.05	0.100	0.02	0.546	0.01	0.045	0.04	0.345	0.03	0.250	0.05	16.476	2.35	0.089	0.0
040	0.348	0.06	0.358	0.29	1.108	0.30	0.278	0.17	0.508	0.26	0.290	0.05	13.210	1.28	0.138	0.0
041	0.223	0.03	0.112	0.01	0.887	0.11	0.095	0.00	0.298	0.24	0.279	0.04	12.217	0.64	0.128	0.0
042	0.499	0.02	0.125	0.01	0.624	0.03	0.081	0.02	0.871	0.21	0.312	0.01	16.810	2.96	0.106	0.0
043	1.581	0.18	1.726	1.29	1.446	0.45	0.393	0.16	2.334	0.21	0.344	0.01	17.845	2.25	0.199	0.0
044	0.307	0.09	0.124	0.01	0.556	0.07	0.068	0.01	0.186	0.02	0.310	0.03	12.414	1.24	0.124	0.0
045	0.481	0.11	0.161	0.11	1.016	0.12	0.091	0.01	0.428	0.22	0.267	0.00	15.508	1.21	0.144	0.0
080	1.318	0.02	0.220	0.15	2.050	0.03	0.337	0.01	1.318	0.02	0.366	0.01	21.222	1.12	[illegible]	0.0
081	1.820	0.11	0.217	0.09	1.085	0.12	0.191	0.01	1.604	0.03	0.217	0.01	17.330	1.17	[illegible]	0.0
082	0.547	0.01	0.137	0.00	1.367	0.25	0.212	0.01	0.685	0.29	0.342	0.01	20.532	3.10	[illegible]	0.1
083	2.613	0.01	0.305	0.09	1.568	0.00	0.253	0.09	2.200	0.57	0.381	0.11	24.606	0.49	0.377	0.0
Ar.Mean	0.500	0.10	0.267	0.11	1.112	0.20	0.219	0.07	0.525	0.14	0.293	0.02	14.622	1.33	0.154	0.0
Std.Dev.	0.450	0.08	0.294	0.20	0.836	0.35	0.291	0.11	0.458	0.14	0.033	0.03	3.193	1.32	0.068	0.0

A R I Z O N A   P U B L I C   S E R V I C E
MONTHLY REPORT for 2-87

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

Location Number	PO4	d	CO3	d	HCO3	d	NH4	d	TSS	d	CU	d	Av d	SD(d)
001	0.012	0.00	3.019	0.14	7.247	0.34	0.121	0.01	3.019	0.14	7.061	0.03	0.12	0.18
002	0.012	0.00	2.884	0.08	6.921	0.19	0.115	0.00	2.884	0.08	6.342	0.06	0.11	0.22
003	0.012	0.00	2.918	0.07	7.003	0.17	0.117	0.00	5.576	5.39	8.464	0.55	0.50	1.42
004	0.012	0.00	3.103	0.05	7.448	0.12	0.124	0.00	3.103	0.05	8.504	0.27	0.07	0.09
005	0.011	0.00	2.813	0.87	6.750	2.08	0.112	0.03	9.476	1.82	8.636	0.90	0.49	0.70
006	0.013	0.00	3.168	0.28	7.603	0.68	0.127	0.01	9.362	5.48	9.300	0.20	0.54	1.43
007	0.012	0.00	2.922	0.10	15.197	0.54	0.117	0.00	9.372	2.67	6.138	0.33	0.44	0.81
008	0.012	0.00	3.084	0.01	7.402	0.03	0.123	0.00	8.017	1.20	6.291	0.47	0.25	0.44
009	0.013	0.00	3.181	0.05	7.634	0.12	0.127	0.00	4.759	3.10	6.424	0.28	0.30	0.81
010	0.012	0.00	3.013	0.26	7.231	0.62	0.121	0.01	11.527	4.60	6.382	0.31	0.49	1.20
011	0.069	0.12	2.237	0.18	11.633	0.94	0.089	0.01	61.784	29.12	5.766	0.20	2.33	7.72
012	0.038	0.05	2.683	0.06	13.953	0.34	0.216	0.22	76.694	5.66	5.525	0.19	0.66	1.52
013	0.017	0.01	2.877	0.17	14.961	0.87	0.115	0.01	21.274	0.09	6.142	0.68	0.27	0.47
014	0.038	0.05	3.091	0.23	16.071	1.21	0.124	0.01	15.476	2.40	6.433	0.73	0.41	0.67
015	0.013	0.00	3.187	0.12	7.650	0.28	0.127	0.00	7.024	1.53	6.686	0.65	0.27	0.44
016	0.010	0.00	2.537	0.57	9.239	4.92	0.146	0.07	11.498	0.40	8.736	0.53	0.61	1.29
017	0.011	0.00	2.710	0.05	10.263	7.40	0.108	0.00	5.717	6.06	8.179	0.83	1.18	2.42
018	0.010	0.00	2.552	0.70	6.126	1.68	0.102	0.03	7.887	1.84	8.452	0.18	0.37	0.63
019	0.011	0.00	2.649	0.80	6.358	1.92	0.106	0.03	7.548	2.90	7.907	0.21	0.57	0.91
02[illegible]	0.013	0.00	3.307	0.67	7.938	1.62	0.132	0.03	8.357	9.42	10.822	1.68	1.11	2.46
02[illegible]	0.096	0.04	3.006	0.12	11.506	8.86	0.597	0.46	8.418	0.33	6.494	0.25	0.86	2.34
022	0.011	0.00	2.793	0.21	6.703	0.50	0.112	0.01	4.241	3.10	6.633	0.29	0.38	0.83
023	0.046	0.07	3.315	0.05	17.235	0.25	0.133	0.00	91.384	25.18	7.024	0.69	1.95	6.69
024	0.131	0.19	2.916	0.50	10.728	6.25	0.543	0.83	11.232	5.42	6.608	0.22	1.11	2.04
025	0.012	0.00	2.903	0.01	6.967	0.03	0.116	0.00	11.609	2.27	7.430	1.13	0.35	0.68
026	0.011	0.00	2.670	0.14	6.409	0.34	0.159	0.10	8.516	1.68	9.172	4.53	1.18	2.48
027	0.011	0.00	2.812	0.14	6.750	0.34	0.170	0.12	5.408	5.33	9.058	0.57	0.65	1.44
028	0.010	0.00	2.468	0.29	12.832	1.51	0.099	0.01	23.690	13.94	8.669	0.43	1.28	3.68
030	0.011	0.00	2.649	0.17	13.776	0.88	1.162	0.14	143.226	19.74	8.228	1.48	1.87	5.18
031	0.027	0.03	2.709	0.09	14.087	0.47	0.219	0.22	13.022	2.60	6.443	0.33	0.35	0.68
032	0.058	0.04	2.909	0.13	10.966	7.66	0.235	0.24	14.586	4.14	6.760	1.23	1.04	2.20
033	0.012	0.00	2.948	0.00	11.203	8.26	0.177	0.12	8.845	1.18	6.722	1.65	0.91	2.19
034	0.011	0.00	2.812	0.22	6.750	0.53	0.112	0.01	2.812	0.22	6.598	1.51	0.29	0.44
035	0.012	0.00	3.078	0.16	7.386	0.37	0.123	0.01	3.078	0.16	6.338	0.20	0.21	0.50
036	0.012	0.00	3.013	0.03	7.231	0.06	0.121	0.00	3.013	0.03	6.990	0.06	0.21	0.60
037	0.014	0.00	3.381	0.01	8.116	0.03	0.135	0.00	3.381	0.01	7.032	1.06	0.22	0.44
038	0.011	0.00	2.746	0.02	6.590	0.06	0.110	0.00	4.660	3.80	8.513	0.18	0.50	1.13
039	0.010	0.00	2.504	0.51	6.010	1.22	0.100	0.02	3.629	1.74	8.457	0.37	0.46	0.76
040	0.012	0.00	2.903	0.48	6.967	1.15	0.116	0.02	26.421	2.57	6.663	0.75	0.53	0.72
041	0.011	0.00	2.793	0.36	6.703	0.87	0.112	0.01	8.938	1.16	6.376	1.05	0.32	0.42
042	0.012	0.00	3.121	0.15	7.490	0.35	0.125	0.01	4.645	2.90	8.231	0.37	0.50	1.04
043	0.235	0.20	3.435	0.10	12.987	9.25	1.510	0.23	27.426	7.47	8.185	1.47	1.66	2.93
044	0.012	0.00	3.103	0.31	7.448	0.74	0.124	0.01	4.733	3.57	6.319	0.14	0.45	0.97
045	0.011	0.00	2.673	0.02	6.416	0.06	0.107	0.00	6.411	2.08	8.610	1.04	0.36	0.63
08[illegible]	0.029	0.03	3.660	0.06	8.784	0.14	0.146	0.00	13.890	4.16	10.912	1.50	0.52	1.15
08[illegible]	0.009	0.00	2.168	0.07	5.203	0.17	0.129	0.08	17.770	0.29	8.017	0.35	0.18	0.30
082	0.021	0.01	3.420	0.06	8.208	0.14	0.137	0.00	11.634	1.57	9.984	0.37	0.43	0.87
083	0.015	0.00	3.810	1.08	9.144	2.59	0.152	0.04	15.894	3.01	11.626	2.85	0.79	1.14
Ar.Mean	0.025	0.02	2.930	0.23	9.067	1.65	0.199	0.07	16.518	4.24	7.631	0.74	0.64	1.46
Std.dev.	0.039	0.04	0.326	0.25	3.101	2.58	0.260	0.14	25.750	6.05	1.422	0.80	0.50	1.56

ARIZONA PUBLIC SERVICE
MONTHLY REPORT for 2-87

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	LIQUID CLOUDY		
012	BIRD DROPPINGS ON SCREEN	LIQUID DIRTY	
013			
014			
015			
016			
017	PAINT CHIPS	2 PIECES OF SCREEN	
018			
019			
020			
021			
022			
023	DIRT,INSECTS,PLANT PARTS	LIQUID DIRTY	
024		BIRD DROPPINGS ON SCREEN	
025			
026			
027			
028			
030	BIRD DROPPINGS ON SCREEN	BIRD DROPPINGS ON SCREEN	
031			
032	FOAM	SCREEN MISSING	
033			
034			
035			
036			
037			
038			
039			
040			
041			
042			
043	BIRD DROPPINGS		
044			
045			
080			
081			
082			
083			

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

MONTHLY REPORT for 3-87

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	0.746	0.53	0.186	0.13	0.742	0.29	0.118	0.04	0.280	0.20	0.308	0.02	19.714	1.03	0.047	0.03
002	0.544	0.00	0.204	0.14	0.476	0.14	0.102	0.01	0.204	0.00	0.340	0.00	19.730	1.36	0.163	0.11
003	0.254	0.02	0.127	0.01	0.575	0.17	0.101	0.04	0.191	0.02	0.318	0.03	18.422	0.18	0.032	0.00
004	0.232	0.02	0.116	0.01	0.989	0.18	0.099	0.04	0.174	0.01	0.290	0.02	18.578	1.24	0.049	0.04
005	0.237	0.02	0.118	0.01	0.534	0.15	0.067	0.07	0.177	0.01	0.296	0.02	18.894	1.12	0.030	0.00
006	0.239	0.01	0.181	0.13	1.014	0.07	0.137	0.05	0.179	0.01	0.299	0.01	19.083	1.50	0.066	0.01
007	0.222	0.04	0.172	0.14	0.634	0.13	0.079	0.04	0.136	0.03	0.226	0.05	19.237	0.61	0.041	0.03
008	0.395	0.01	0.132	0.00	0.461	0.12	0.079	0.00	0.296	0.19	0.329	0.01	19.768	0.32	0.049	0.03
009	0.427	0.02	0.142	0.01	0.497	0.12	0.092	0.01	0.214	0.01	0.356	0.02	19.950	0.90	0.060	0.05
010	0.527	0.04	0.200	0.15	0.596	0.18	0.119	0.01	0.301	0.22	0.329	0.03	20.346	2.29	0.057	0.05
011	0.441	0.09	0.127	0.01	0.756	0.18	0.133	0.00	0.190	0.02	0.317	0.03	19.650	0.56	0.077	0.09
012	0.385	0.26	0.096	0.06	0.640	0.01	0.128	0.00	0.192	0.00	0.320	0.00	21.761	2.38	0.128	0.08
013	0.262	0.02	0.097	0.06	0.860	0.46	0.099	0.13	0.197	0.01	0.328	0.02	21.000	1.54	0.105	0.01
014	0.342	0.10	0.106	0.08	1.912	0.62	0.214	0.01	0.207	0.02	0.346	0.04	21.386	0.94	0.035	0.00
015	0.144	0.01	0.107	0.07	1.078	0.19	0.079	0.02	0.215	0.01	0.359	0.02	21.536	0.96	0.086	0.00
016	0.352	0.07	0.198	0.18	0.708	0.06	0.091	0.01	0.152	0.01	0.253	0.02	18.683	0.63	0.086	0.00
017	0.196	0.14	0.095	0.06	0.761	0.45	0.054	0.04	0.193	0.02	0.321	0.03	19.232	0.96	0.089	0.02
018	0.227	0.02	0.114	0.01	0.681	0.06	0.068	0.02	0.260	0.19	0.284	0.03	18.712	0.63	0.068	0.01
019	0.262	0.02	0.199	0.14	0.652	0.22	0.085	0.03	0.197	0.01	0.328	0.02	18.375	1.05	0.098	0.01
020	0.409	0.08	0.091	0.00	0.637	0.01	0.077	0.03	0.204	0.13	0.227	0.00	19.553	0.49	0.100	0.00
02[illegible]	0.391	0.33	0.223	0.22	0.616	0.11	0.078	0.02	0.168	0.00	0.280	0.00	18.477	1.30	0.059	0.06
022	0.289	0.10	0.232	0.01	0.695	0.20	0.069	0.02	0.174	0.01	0.291	0.01	20.357	2.10	0.060	0.06
023	0.400	0.04	1.131	0.03	6.373	0.77	1.531	0.00	0.200	0.02	0.333	0.03	18.675	1.65	0.195	0.11
024	0.138	0.01	0.205	0.12	0.835	0.34	0.112	0.09	0.207	0.02	0.346	0.03	21.396	0.28	0.060	0.05
025	0.252	0.00	0.818	0.12	3.526	0.28	1.101	0.03	0.189	0.00	0.315	0.00	21.402	0.18	0.126	0.00
026	0.179	0.12	0.179	0.12	0.712	0.23	0.065	0.01	0.178	0.00	0.297	0.01	20.218	0.36	0.044	0.03
027	0.220	0.03	0.272	0.08	0.770	0.09	0.077	0.01	0.165	0.02	0.275	0.03	19.800	2.40	0.066	0.07
028	0.205	0.02	0.151	0.09	1.827	0.44	0.111	0.07	0.153	0.01	0.256	0.02	18.905	0.76	0.087	0.02
030	0.288	0.16	0.339	0.06	2.302	0.08	0.458	0.03	0.170	0.03	0.283	0.05	18.498	0.03	0.123	0.00
031	0.295	0.22	0.248	0.31	1.581	1.67	0.153	0.14	0.145	0.01	0.242	0.02	17.920	0.42	0.092	0.00
032	0.183	0.14	0.183	0.14	1.203	0.40	0.107	0.01	0.179	0.02	0.299	0.04	19.591	0.93	0.061	0.06
033	0.232	0.01	0.174	0.11	0.639	0.10	0.087	0.03	0.174	0.00	0.291	0.01	19.189	1.69	0.079	0.10
034	0.152	0.07	0.152	0.07	0.502	0.32	0.071	0.03	0.157	0.03	0.261	0.05	18.230	2.52	0.052	0.06
035	0.443	0.35	0.197	0.15	0.657	0.58	0.078	0.03	0.194	0.02	0.323	0.03	18.632	2.16	0.054	0.04
036	0.350	0.27	0.471	0.51	0.513	0.06	0.042	0.02	0.172	0.02	0.287	0.03	20.095	3.40	0.029	0.00
037	0.196	0.12	0.196	0.12	0.654	0.24	0.049	0.03	0.197	0.01	0.328	0.01	19.687	0.80	0.063	0.06
038	0.159	0.11	0.266	0.32	0.476	0.12	0.058	0.01	0.158	0.00	0.264	0.01	18.461	0.49	0.055	0.06
039	0.206	0.02	0.152	0.09	0.460	0.05	0.038	0.02	0.154	0.02	0.257	0.03	17.973	0.85	0.055	0.06
040	0.145	999.99	0.289	999.99	1.302	999.99	0.260	999.99	0.217	999.99	0.362	999.99	21.696	999.99	0.036	999.99
041	0.164	0.11	0.109	0.00	0.492	0.12	0.082	0.03	0.164	0.00	0.273	0.01	19.661	1.80	0.046	0.04
042	0.119	0.02	0.119	0.02	0.199	0.27	0.046	0.04	0.179	0.02	0.299	0.04	17.759	2.37	0.088	0.11
043	0.226	0.02	0.113	0.01	0.898	0.13	0.356	0.05	0.170	0.02	0.283	0.03	17.432	1.56	0.047	0.03
044	0.206	0.13	0.139	0.01	0.555	0.03	0.083	0.02	0.208	0.01	0.347	0.02	21.525	2.55	0.060	0.05
045	0.475	0.20	0.120	0.01	1.492	0.23	0.142	0.06	0.274	0.20	0.300	0.03	19.146	0.69	0.127	0.05
08[illegible]	0.382	0.15	0.123	0.06	1.199	0.69	0.152	0.04	0.421	0.07	0.210	0.03	19.684	0.66	0.046	0.05
08[illegible]	1.052	0.38	0.149	0.08	0.867	0.21	0.131	0.02	0.508	0.06	0.254	0.03	19.794	1.37	0.131	0.02
082	0.357	0.16	0.083	0.02	1.320	0.41	0.145	0.03	0.194	0.17	0.207	0.05	18.465	2.09	0.087	0.03
083	0.553	0.04	0.111	0.01	1.052	0.18	0.149	0.02	0.389	0.14	0.276	0.02	22.072	0.66	0.077	0.02
Ar.Mean	0.315	0.10	0.203	0.09	1.019	0.26	0.164	0.03	0.209	0.04	0.296	0.02	19.549	1.21	0.074	0.04
Std.Dev.	0.171	0.12	0.181	0.10	0.974	0.28	0.258	0.03	0.071	0.07	0.039	0.01	1.184	0.78	0.035	0.03

ARIZONA PUBLIC SERVICE
MONTHLY REPORT for 3-87

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

Location Number	PO4	d	CO3	d	HCO3	d	NH4	d	TSS	d	CU	d	Av d	SD(d)
001	0.012	0.00	3.080	0.16	7.393	0.39	0.123	0.01	5.293	4.59	12.005	0.01	0.53	1.20
002	0.014	0.00	3.402	0.00	8.164	0.00	0.136	0.00	5.103	3.40	12.382	0.82	0.43	0.94
003	0.013	0.00	3.181	0.25	7.633	0.60	0.127	0.01	8.956	3.24	11.893	0.81	0.38	0.86
004	0.012	0.00	2.903	0.19	6.967	0.47	0.116	0.01	6.550	7.10	11.932	0.82	0.73	1.87
005	0.012	0.00	2.958	0.19	7.100	0.47	0.118	0.01	7.139	2.83	11.119	0.49	0.39	0.77
006	0.012	0.00	2.986	0.14	7.167	0.33	0.119	0.01	6.958	8.08	11.167	0.40	0.77	2.14
007	0.009	0.00	2.263	0.46	5.432	1.09	0.091	0.02	3.509	2.95	12.177	1.55	0.51	0.84
008	0.013	0.00	3.295	0.05	7.907	0.13	0.132	0.00	4.929	3.21	12.258	0.73	0.34	0.85
009	0.014	0.00	3.562	0.16	8.550	0.39	0.142	0.01	6.000	4.71	11.305	1.63	0.57	1.28
010	0.013	0.00	3.295	0.27	7.907	0.64	0.132	0.01	5.695	5.07	12.287	0.71	0.69	1.40
011	0.013	0.00	3.174	0.29	7.618	0.71	0.127	0.01	10.039	4.14	11.169	1.88	0.57	1.14
012	0.013	0.00	3.201	0.03	7.682	0.06	0.128	0.00	12.171	3.94	12.355	0.28	0.51	1.17
013	0.013	0.00	3.281	0.24	7.875	0.58	0.131	0.01	14.582	8.94	12.002	0.49	0.89	2.35
014	0.020	0.01	3.455	0.38	8.293	0.90	0.138	0.02	15.129	1.11	12.153	1.58	0.41	0.52
015	0.014	0.00	3.589	0.16	8.614	0.39	0.144	0.01	11.518	3.39	12.373	2.85	0.58	1.11
016	0.010	0.00	2.528	0.22	6.067	0.53	0.101	0.01	6.639	3.61	11.122	0.98	0.45	0.96
017	0.013	0.00	3.214	0.27	7.714	0.64	0.129	0.01	7.098	1.88	11.124	1.06	0.40	0.56
018	0.011	0.00	2.839	0.27	6.814	0.64	0.114	0.01	10.275	3.24	10.070	0.64	0.41	0.85
019	0.013	0.00	3.281	0.19	7.875	0.45	0.131	0.01	9.975	13.20	10.751	0.17	1.11	3.49
020	0.009	0.00	2.274	0.05	5.458	0.12	0.091	0.00	9.077	3.45	10.916	0.23	0.33	0.91
021	0.011	0.00	2.799	0.03	6.718	0.06	0.112	0.00	6.421	7.22	10.359	1.11	0.75	[illegible]
022	0.012	0.00	2.906	0.13	6.975	0.32	0.116	0.01	8.786	6.21	11.387	0.06	0.66	[illegible]
023	0.200	0.02	3.335	0.29	8.004	0.71	0.133	0.01	139.768	0.96	7.835	0.91	0.40	0.52
024	0.014	0.00	3.455	0.27	8.293	0.64	0.138	0.01	7.575	0.79	11.921	0.87	0.25	0.30
025	0.151	0.02	3.147	0.03	7.554	0.06	0.126	0.00	85.612	3.25	11.331	0.60	0.33	0.86
026	0.024	0.02	2.973	0.05	7.136	0.13	0.119	0.00	7.746	3.71	11.476	0.09	0.35	0.97
027	0.032	0.04	2.750	0.33	6.600	0.80	0.110	0.01	7.833	5.33	10.242	0.18	0.67	1.48
028	0.010	0.00	2.558	0.24	6.139	0.58	0.102	0.01	6.702	8.05	10.398	0.65	0.78	2.11
030	0.072	0.02	2.826	0.51	6.782	1.22	0.113	0.02	33.498	9.40	10.338	0.52	0.87	2.48
031	0.015	0.01	2.424	0.19	5.818	0.45	0.097	0.01	8.719	12.78	9.301	0.33	1.18	3.36
032	0.012	0.00	2.987	0.40	7.168	0.96	0.119	0.02	6.530	0.31	10.473	0.22	0.26	0.32
033	0.012	0.00	2.906	0.08	6.975	0.19	0.116	0.00	5.486	5.08	11.099	0.04	0.53	1.38
034	0.010	0.00	2.612	0.51	6.268	1.22	0.104	0.02	2.612	0.51	10.861	0.98	0.46	0.71
035	0.013	0.00	3.228	0.29	7.746	0.71	0.129	0.01	12.340	18.52	10.478	0.98	1.70	4.88
036	0.011	0.00	2.866	0.32	6.879	0.77	0.115	0.01	8.547	11.04	11.356	1.50	1.28	2.96
037	0.013	0.00	3.281	0.13	7.875	0.32	0.131	0.01	10.674	14.65	11.617	0.61	1.22	3.87
038	0.011	0.00	2.638	0.08	6.332	0.19	0.106	0.00	7.728	10.26	10.554	0.32	0.86	2.71
039	0.010	0.00	2.571	0.27	6.171	0.64	0.103	0.01	8.665	11.92	10.183	1.06	1.07	3.14
040	0.014	999.99	3.616	999.99	8.679	999.99	0.145	999.99	27.482	999.99	12.584	999.99	999.99	999.99
041	0.011	0.00	2.732	0.05	6.557	0.13	0.109	0.00	9.629	13.85	12.021	0.24	1.17	3.68
042	0.012	0.00	2.987	0.40	7.168	0.96	0.119	0.02	5.855	6.14	10.225	1.84	0.87	1.69
043	0.079	0.01	2.826	0.29	6.782	0.71	0.113	0.01	15.530	9.65	10.078	0.41	0.93	2.55
044	0.014	0.00	3.469	0.19	8.325	0.45	0.139	0.01	3.469	0.19	12.705	1.38	0.36	0.73
045	0.012	0.00	3.000	0.27	7.200	0.64	0.120	0.01	15.493	3.41	9.933	0.31	0.44	0.88
080	0.012	0.01	2.105	0.34	5.052	0.81	0.084	0.01	9.968	1.74	10.423	0.83	0.39	[illegible]
081	0.021	0.02	2.542	0.31	6.100	0.73	0.102	0.01	14.417	7.81	10.706	2.30	0.95	[illegible]
082	0.019	0.02	2.069	0.51	4.965	1.22	0.083	0.02	12.368	4.30	10.292	1.71	0.77	[illegible]
083	0.011	0.00	2.764	0.19	6.633	0.47	0.111	0.01	14.450	5.43	12.122	1.36	0.61	1.44
Ar.Mean	0.023	0.01	2.961	0.23	7.107	0.55	0.118	0.01	13.970	5.84	11.143	0.84	0.66	1.61
Std.dev.	0.035	0.01	0.387	0.13	0.929	0.32	0.015	0.01	22.228	4.24	0.974	0.63	0.32	1.06

ARIZONA PUBLIC SERVICE
MONTHLY REPORT for 3-87

DEPOSITION DATA
Comments and Messages Only

Location Number	Sample A Comments	Sample B Comments	Processing Messages
001			
002			
003			
004			
005			
006			
007		PAINT CHIPS	
008			
009			
010			
011	PAINT CHIPS		
012			
013			
014			
015			
016			
017			
018			
019			
02[illegible]			
0[illegible]	BIRD DROPPINGS	BIRD DROPPINGS, PAINT CHIPS	
022			
023.	LIQUID DIRTY	LIQUID DIRTY	
024			
025	LIQUID DIRTY	LIQUID DIRTY	
026			
027	BIRD DROPPINGS ON SCREEN	BIRD DROPPINGS ON SCREEN	
028			
030			
031	LIQUID DIRTY,SAND,RAW COTTON ON SCREEN	SAND,RAW COTTON IN SCREEN	
032			
033			
034			
035			
036			
037			
038			
039			
040	VOID/POSSIBLE CONTAMINATION		MISSING SAMPLE A
041			
042			
043			
044			
045			
08[illegible]		PIECES OF BURNED MATTER	
08[illegible]			
082			
083			

A R I Z O N A   P U B L I C   S E R V I C E
MONTHLY REPORT for 4-87

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	0.364	0.06	0.105	0.01	1.050	0.14	0.169	0.04	0.157	0.02	0.262	0.04	2.625	0.35	0.043	0.0
002	0.240	0.08	0.053	0.01	0.709	0.06	0.130	0.01	0.141	0.11	0.132	0.02	1.324	0.18	0.013	0.0
003	0.364	0.03	0.133	0.01	0.798	0.08	0.213	0.02	0.332	0.03	0.166	0.02	16.625	1.75	0.037	0.0
004	0.230	0.01	0.057	0.04	0.843	0.13	0.146	0.02	0.115	0.00	0.192	0.01	14.563	1.05	0.041	0.0
005	0.271	0.05	0.067	0.06	0.764	0.04	0.181	0.02	0.271	0.05	0.154	0.06	13.551	0.26	0.069	0.0
006	0.388	0.06	0.057	0.03	1.349	0.04	0.215	0.03	0.388	0.06	0.194	0.03	14.267	0.27	0.043	0.0
007	0.185	0.06	0.064	0.07	0.997	0.06	0.128	0.01	0.119	0.09	0.131	0.01	1.312	0.08	0.028	0.0
008	0.233	0.06	0.050	0.03	0.667	0.14	0.120	0.01	0.100	0.00	0.167	0.00	1.665	0.02	0.017	0.0
009	0.262	0.15	0.065	0.00	0.711	0.08	0.126	0.01	0.097	0.01	0.162	0.01	1.621	0.11	0.016	0.0
010	0.190	0.07	0.040	0.02	0.966	0.01	0.175	0.01	0.119	0.07	0.135	0.01	1.346	0.13	0.013	0.0
011	0.281	0.00	0.094	0.09	1.146	0.14	0.311	0.11	0.257	0.05	0.117	0.00	1.169	0.00	0.082	0.0
012	0.162	0.06	0.089	0.08	1.117	0.10	0.306	0.06	0.181	0.07	0.115	0.01	1.147	0.13	0.043	0.0
013	0.244	0.06	0.087	0.04	1.194	0.05	0.289	0.03	0.209	0.01	0.152	0.04	1.522	0.40	0.052	0.0
014	0.300	0.11	0.066	0.01	2.021	0.65	0.532	0.35	0.229	0.04	0.165	0.02	15.132	0.62	0.073	0.0
015	0.131	0.01	0.065	0.00	0.653	0.04	0.108	0.04	0.146	0.09	0.163	0.01	16.624	1.06	0.031	0.0
016	0.264	0.06	0.032	0.01	0.909	0.05	0.093	0.14	0.259	0.03	0.110	0.02	15.885	0.57	0.083	0.0
017	0.286	0.03	0.083	0.01	0.699	0.04	0.158	0.04	0.124	0.02	0.207	0.04	14.816	0.97	0.030	0.0
018	0.328	0.14	1.221	2.34	0.496	0.04	0.059	0.01	0.163	0.09	0.164	0.07	14.374	0.05	0.047	0.0
019	0.392	0.07	0.072	0.03	0.625	0.05	0.113	0.11	0.173	0.17	0.181	0.07	14.087	0.97	0.046	0.0
020	1.016	0.12	0.102	0.01	0.575	0.09	0.112	0.11	0.789	0.02	0.107	0.05	14.709	1.41	0.051	0.0
021	0.197	0.02	0.160	0.18	0.724	0.07	0.117	0.07	0.099	0.01	0.165	0.02	1.646	0.17	[illegible]	0.0
022	0.184	0.05	0.044	0.02	0.665	0.07	0.091	0.07	0.092	0.03	0.153	0.04	1.531	0.44	[illegible]	0.0
023	1.438	0.24	0.994	0.21	9.073	1.69	2.488	0.15	0.497	0.10	0.276	0.00	14.366	1.99	0.063	0.0
024	0.257	0.06	0.149	0.15	0.596	0.11	0.141	0.02	0.088	0.04	0.147	0.07	15.746	1.79	0.015	0.0
025	0.493	0.00	1.132	0.40	5.405	1.22	2.373	0.40	0.340	0.09	0.130	0.01	16.632	0.65	0.198	0.0
026	0.165	0.04	0.049	0.03	0.501	0.00	0.069	0.06	0.101	0.01	0.168	0.02	1.677	0.23	0.017	0.0
027	0.255	0.02	0.195	0.15	0.605	0.01	0.202	0.04	0.179	0.18	0.160	0.02	14.019	0.04	0.058	0.0
028	0.404	0.40	0.085	0.04	1.337	0.00	0.154	0.04	0.089	0.02	0.148	0.04	13.886	1.03	0.069	0.0
030	0.540	0.08	0.360	0.05	3.988	0.16	1.163	0.00	0.367	0.23	0.225	0.03	14.331	0.39	0.170	0.0
031	0.682	0.10	0.170	0.02	3.740	0.67	0.423	0.21	0.642	0.18	0.175	0.05	1.750	0.46	0.068	0.0
032	0.292	0.08	0.083	0.00	0.917	0.00	0.137	0.06	0.187	0.12	0.208	0.00	2.083	0.00	0.021	0.0
033	0.197	0.01	0.057	0.02	0.672	0.01	0.097	0.06	0.136	0.13	0.144	0.05	1.437	0.46	0.062	0.0
034	0.210	0.02	0.070	0.01	0.453	0.03	0.069	0.05	0.105	0.01	0.175	0.02	1.750	0.17	0.017	0.0
035	0.260	0.01	0.087	0.00	0.520	0.02	0.091	0.05	0.130	0.01	0.217	0.01	2.167	0.08	0.022	0.0
036	0.181	0.07	0.060	0.02	0.412	0.04	0.068	0.02	0.091	0.03	0.151	0.06	1.510	0.56	0.015	0.0
037	0.222	0.03	0.074	0.01	0.406	0.03	0.085	0.00	0.111	0.01	0.185	0.02	1.854	0.21	0.019	0.0
038	0.226	0.03	0.075	0.01	0.683	0.23	0.143	0.00	0.113	0.01	0.189	0.02	13.890	0.68	0.053	0.0
039	0.184	0.04	0.061	0.01	0.456	0.05	0.087	0.01	0.092	0.02	0.153	0.04	13.264	0.47	0.042	0.0
040	0.404	0.36	0.193	0.15	1.641	0.14	0.560	0.05	0.111	0.05	0.129	0.03	1.290	0.33	0.021	0.0
041	0.187	0.09	0.047	0.00	0.723	0.14	0.100	0.00	0.163	0.05	0.117	0.00	1.167	0.00	0.012	0.0
042	0.212	0.10	0.073	0.02	0.505	0.04	0.124	0.03	0.110	0.02	0.183	0.04	14.809	0.49	0.046	0.0
043	0.477	0.05	0.095	0.01	0.904	0.01	0.213	0.04	0.472	0.14	0.239	0.03	14.714	1.17	0.067	0.0
044	0.220	0.07	0.063	0.00	0.753	0.15	0.141	0.03	0.094	0.00	0.157	0.00	1.566	0.04	0.033	0.0
045	0.491	0.21	0.113	0.07	0.946	0.20	0.170	0.06	0.454	0.14	0.190	0.01	14.400	1.03	0.019	0.0
080	0.556	0.05	0.070	0.01	1.832	0.32	0.293	0.11	0.490	0.18	0.174	0.02	14.936	0.67	[illegible]	0.0
081	0.887	0.07	0.092	0.02	1.109	0.22	0.220	0.03	0.436	0.72	0.115	0.02	16.400	0.80	[illegible]	0.0
082	0.798	0.10	0.114	0.00	0.798	0.01	0.197	0.03	0.713	0.07	0.142	0.00	14.820	0.22	[illegible]	0.0
083	0.458	0.01	0.084	0.02	1.047	0.13	0.200	0.01	0.374	0.01	0.210	0.04	14.500	1.18	0.068	0.0
Ar.Mean	0.358	0.08	0.155	0.09	1.244	0.16	0.290	0.06	0.234	0.08	0.167	0.03	8.761	0.54	0.050	0.0
Std.Dev.	0.249	0.08	0.258	0.34	1.493	0.31	0.485	0.08	0.176	0.11	0.038	0.02	6.698	0.51	0.037	0.0

ARIZONA PUBLIC SERVICE

MONTHLY REPORT for 4-87

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

Location Number	PO4	d	CO3	d	HCO3	d	NH4	d	TSS	d	CU	d	Av d	SD(d)
001	0.010	0.00	2.625	0.35	6.300	0.85	0.105	0.01	8.890	0.15	0.357	0.27	0.17	0.23
002	0.005	0.00	1.324	0.18	3.176	0.42	0.053	0.01	7.624	0.56	0.053	0.01	0.12	0.17
003	0.010	0.01	1.662	0.17	3.990	0.42	0.066	0.01	13.720	4.76	8.295	0.21	0.54	1.30
004	0.008	0.00	1.918	0.06	4.603	0.15	0.077	0.00	12.326	6.55	7.203	0.68	0.62	1.73
005	0.023	0.00	1.543	0.64	3.703	1.54	0.135	0.12	10.491	4.37	6.664	0.35	0.54	1.18
006	0.011	0.01	1.939	0.28	4.654	0.67	0.078	0.01	11.859	7.88	6.937	0.24	0.69	2.08
007	0.005	0.00	1.312	0.08	3.150	0.20	0.052	0.00	10.737	0.89	0.103	0.10	0.12	0.23
008	0.007	0.00	1.665	0.02	3.997	0.05	0.067	0.00	8.978	4.54	0.050	0.03	0.35	1.21
009	0.006	0.00	1.621	0.11	3.891	0.26	0.065	0.00	8.074	1.39	0.032	0.00	0.15	0.37
010	0.010	0.01	1.346	0.13	3.229	0.32	0.054	0.01	10.279	3.16	0.041	0.03	0.28	0.83
011	0.033	0.01	1.169	0.00	2.806	0.00	0.070	0.05	18.706	8.42	0.035	0.02	0.63	2.24
012	0.025	0.01	1.147	0.13	2.753	0.32	0.046	0.01	24.697	0.11	0.046	0.01	0.08	0.08
013	0.011	0.01	1.522	0.40	3.653	0.95	0.061	0.02	17.471	6.35	0.070	0.07	0.60	1.68
014	0.041	0.05	1.654	0.22	3.971	0.53	0.066	0.01	23.735	10.41	6.847	1.13	1.01	2.73
015	0.013	0.01	1.632	0.09	3.918	0.21	0.065	0.00	12.406	0.67	8.488	0.46	0.19	0.32
016	0.017	0.00	1.100	0.25	2.640	0.60	0.127	0.06	11.050	3.38	8.405	1.13	0.45	0.90
017	0.008	0.00	2.068	0.36	4.963	0.87	0.083	0.01	20.096	9.59	7.363	0.39	0.89	2.53
018	0.012	0.01	1.639	0.71	3.934	1.70	0.066	0.03	14.966	8.33	7.147	0.11	0.97	2.24
019	0.019	0.02	1.811	0.66	4.346	1.59	0.072	0.03	15.210	5.58	7.401	0.57	0.71	1.48
020	0.022	0.03	1.071	0.51	2.571	1.23	0.141	0.17	10.500	5.06	7.140	0.60	0.68	1.34
021	0.007	0.00	1.646	0.17	3.950	0.40	0.066	0.01	8.737	5.02	0.066	0.01	0.44	1.32
022	0.014	0.01	1.531	0.44	3.675	1.05	0.061	0.02	10.850	0.70	0.087	0.03	0.22	0.32
023	0.061	0.03	2.764	0.04	9.977	6.79	0.440	0.66	165.857	2.57	3.703	0.27	1.06	1.85
024	0.025	0.02	1.467	0.68	3.521	1.64	0.059	0.03	12.234	7.37	8.166	1.03	0.93	1.95
025	0.011	0.01	1.301	0.13	4.765	3.60	0.052	0.01	172.059	27.88	7.262	0.30	2.48	7.37
026	0.010	0.01	1.677	0.23	4.025	0.55	0.067	0.01	4.365	5.60	0.123	0.18	0.50	1.48
027	0.063	0.05	1.596	0.15	3.831	0.36	0.681	0.51	13.440	2.54	6.961	0.68	0.34	0.67
028	0.026	0.00	1.479	0.39	3.549	0.93	0.085	0.04	12.831	8.28	7.277	0.15	0.81	2.18
030	0.023	0.01	2.250	0.34	5.400	0.82	0.187	0.21	60.660	28.34	6.986	0.17	2.20	7.52
031	0.045	0.00	1.750	0.46	9.312	0.37	0.070	0.02	32.133	13.60	0.070	0.02	1.16	3.59
032	0.008	0.00	2.083	0.00	5.000	0.00	0.083	0.00	9.167	0.00	0.083	0.00	0.02	0.04
033	0.006	0.00	1.437	0.46	3.450	1.10	0.057	0.02	7.175	5.65	0.057	0.02	0.57	1.49
034	0.007	0.00	1.750	0.17	4.200	0.40	0.070	0.01	4.250	4.83	0.085	0.10	0.41	1.28
035	0.009	0.00	2.167	0.08	5.200	0.20	0.087	0.00	6.067	0.23	0.087	0.00	0.05	0.08
036	0.006	0.00	1.510	0.56	3.625	1.35	0.060	0.02	4.004	0.84	0.060	0.02	0.26	0.42
037	0.007	0.00	1.854	0.21	4.450	0.50	0.074	0.01	4.758	1.68	0.055	0.03	0.20	0.45
038	0.011	0.01	1.886	0.21	4.526	0.51	0.075	0.01	10.560	1.20	7.264	0.30	0.23	0.35
039	0.012	0.01	1.532	0.36	3.677	0.87	0.061	0.01	7.624	1.21	7.281	0.52	0.26	0.38
040	0.033	0.00	1.290	0.33	3.097	0.79	0.052	0.01	50.956	2.91	0.103	0.03	0.37	0.76
041	0.007	0.00	1.167	0.00	2.800	0.00	0.047	0.00	6.300	1.40	0.070	0.05	0.12	0.37
042	0.007	0.00	1.830	0.39	4.391	0.93	0.073	0.02	8.223	1.88	8.179	0.66	0.33	0.53
043	0.028	0.03	2.386	0.27	5.727	0.65	0.191	0.02	20.386	2.43	8.131	0.12	0.36	0.68
044	0.009	0.01	1.566	0.04	3.759	0.11	0.063	0.00	7.182	2.93	0.094	0.06	0.25	0.77
045	0.008	0.00	1.896	0.06	4.551	0.15	0.076	0.00	9.463	1.95	6.943	0.46	0.31	0.55
080	0.021	0.03	1.739	0.16	4.173	0.38	0.103	0.06	16.595	2.65	7.650	0.70	0.38	0.69
081	0.015	0.02	1.150	0.20	2.760	0.48	0.088	0.08	18.710	5.42	8.830	1.66	0.70	1.44
082	0.043	0.02	1.425	0.02	3.420	0.05	0.369	0.28	12.531	2.09	7.127	0.68	0.26	0.56
083	0.016	0.01	2.102	0.43	5.045	1.04	0.084	0.02	13.541	4.45	7.575	0.06	0.53	1.19
Ar.Mean	0.017	0.01	1.667	0.26	4.211	0.81	0.105	0.05	20.468	4.95	4.022	0.31	0.53	1.36
Std.dev.	0.014	0.01	0.378	0.20	1.410	1.08	0.112	0.13	33.011	5.77	3.726	0.37	0.48	1.51

ARIZONA PUBLIC SERVICE
MONTHLY REPORT for 4-87

DEPOSITION DATA
Comments and Messages Only

Location Number	Sample A Comments	Sample B Comments	Processing Messages
001			
002	NEW SCREEN INSTALLED	NEW SCREEN INSTALLED	
003			
004			
005			
006			
007			
008			
009			
010			
011			
012			
013			
014			
015			
016			
017			
018			
019			
020			
021			
022			
023	LIQUID DIRTY	LIQUID DIRTY	
024			
025	LIQUID DIRTY	LIQUID DIRTY	
026			
027			
028			
030			
031			
032			
033			
034			
035			
036			
037			
038			
039			
040			
041			
042			
043			
044			
045			
080			
081			
082			
083			

A R I Z O N A   P U B L I C   S E R V I C E
MONTHLY REPORT for 5-87

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	0.176	0.13	0.135	0.05	1.715	0.54	0.083	0.01	0.396	0.31	0.238	0.07	26.232	2.68	0.156	0.04
002	0.138	0.09	0.108	0.03	1.201	0.16	0.192	0.14	0.340	0.07	0.193	0.08	26.532	3.12	0.136	0.03
003	0.135	0.01	0.200	0.12	1.076	0.06	0.087	0.04	0.300	0.19	0.336	0.02	28.255	1.53	0.162	0.04
004	0.091	0.01	0.091	0.01	1.268	0.25	0.046	0.00	0.274	0.03	0.456	0.04	38.220	0.12	0.136	0.01
005	0.148	0.10	0.099	0.00	0.991	0.38	0.074	0.05	0.298	0.01	0.496	0.01	39.720	0.72	0.104	0.11
006	0.422	0.42	0.368	0.52	1.903	0.81	0.090	0.07	0.318	0.01	0.529	0.01	38.124	0.65	0.212	0.04
007	0.094	0.01	0.094	0.01	0.943	0.05	0.047	0.00	0.283	0.02	0.471	0.03	34.859	0.10	0.047	0.00
008	0.173	0.09	0.118	0.02	0.891	0.25	0.049	0.03	0.273	0.22	0.295	0.05	28.818	0.91	0.124	0.01
009	0.136	0.00	0.136	0.00	1.087	0.01	0.081	0.03	0.306	0.21	0.340	0.00	29.223	1.55	0.136	0.00
010	0.126	0.02	0.260	0.28	1.393	0.42	0.064	0.06	0.356	0.36	0.315	0.04	28.805	1.48	0.213	0.00
011	0.105	0.07	0.140	0.00	1.194	0.15	0.105	0.07	0.211	0.00	0.351	0.00	28.795	1.59	0.197	0.00
012	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
013	0.187	0.12	0.250	0.00	1.689	0.64	0.150	0.07	0.344	0.31	0.312	0.00	29.377	1.46	0.212	0.00
014	0.344	0.15	0.137	0.00	7.530	2.82	0.316	0.06	0.547	0.26	0.343	0.01	28.827	0.76	0.065	0.06
015	0.104	0.07	0.104	0.07	0.974	0.04	0.059	0.05	0.209	0.01	0.348	0.01	29.209	1.15	0.153	0.01
016	0.339	0.25	0.220	0.33	1.378	0.18	0.156	0.10	0.500	0.07	0.231	0.07	27.082	1.62	0.237	0.04
017	0.180	0.12	0.180	0.12	0.958	0.02	0.060	0.00	0.359	0.01	0.598	0.02	38.304	0.96	0.089	0.06
018	0.160	0.11	0.160	0.11	0.958	0.20	0.053	0.00	0.319	0.01	0.532	0.01	37.266	1.50	0.192	0.00
019	0.408	999.99	0.408	999.99	1.428	999.99	0.051	999.99	0.306	999.99	0.510	999.99	38.760	999.99	0.204	999.99
020	0.656	0.58	0.281	0.20	1.306	0.42	0.326	0.03	0.934	0.41	0.465	0.02	40.920	1.58	0.298	0.05
0[illegible]	0.363	0.01	0.182	0.00	0.818	0.20	0.045	0.00	0.272	0.00	0.454	0.01	33.605	2.41	0.096	0.10
02[illegible]	0.281	0.20	0.186	0.01	0.929	0.04	0.046	0.00	0.279	0.01	0.465	0.02	34.409	3.25	0.187	0.12
023	0.709	0.05	1.777	0.36	9.139	2.77	1.360	0.12	0.538	0.39	0.591	0.04	36.684	4.97	0.167	0.11
024	0.265	0.02	0.196	0.12	0.858	0.08	0.068	0.07	0.301	0.22	0.331	0.02	29.782	3.16	0.088	0.11
025	0.415	0.04	0.720	0.13	2.782	0.33	0.432	0.08	0.469	0.15	0.300	0.05	29.127	0.65	0.255	0.01
026	0.377	0.03	0.468	0.16	0.936	0.31	0.047	0.00	0.283	0.02	0.471	0.03	33.943	2.31	0.079	0.06
027	0.287	0.18	0.193	0.01	0.865	0.17	0.048	0.00	0.289	0.01	0.481	0.02	40.476	5.11	0.048	0.00
028	0.332	0.24	0.220	0.01	1.424	0.14	0.055	0.00	0.329	0.02	0.549	0.03	37.392	6.43	0.114	0.11
030	0.624	0.79	1.478	1.11	4.042	2.09	0.424	0.02	1.212	0.12	0.606	0.06	36.360	3.60	0.244	0.07
031	0.369	0.36	0.277	0.18	1.393	0.15	0.070	0.05	0.279	0.01	0.465	0.01	30.659	0.98	0.185	0.07
032	0.294	0.22	0.193	0.02	1.056	0.09	0.048	0.00	0.289	0.03	0.482	0.05	31.773	1.25	0.071	0.04
033	0.286	0.20	0.190	0.01	0.852	0.16	0.071	0.04	0.284	0.01	0.474	0.02	31.275	0.84	0.171	0.04
034	0.271	0.17	0.182	0.01	0.726	0.03	0.045	0.00	0.272	0.01	0.454	0.02	31.762	0.50	0.118	0.02
035	0.153	0.10	0.205	0.00	0.921	0.21	0.077	0.05	0.307	0.00	0.512	0.01	31.725	2.38	0.087	0.07
036	0.274	0.18	0.456	0.55	1.004	0.54	0.132	0.17	0.274	0.00	0.457	0.00	31.971	2.01	0.046	0.00
037	0.239	0.29	0.191	0.00	1.242	0.57	0.091	0.09	0.287	0.00	0.478	0.00	33.471	2.10	0.101	0.11
038	0.350	0.49	0.305	0.18	1.029	0.08	0.078	0.06	0.556	0.47	0.514	0.04	35.898	3.44	0.175	0.01
039	0.095	0.00	0.144	0.10	0.761	0.03	0.071	0.04	0.285	0.01	0.475	0.02	32.292	2.38	0.152	0.03
040	0.250	0.36	0.500	0.14	1.784	0.43	0.300	0.03	0.214	0.00	0.357	0.00	28.545	0.00	0.068	0.06
041	0.092	0.00	0.137	0.09	0.733	0.73	0.069	0.05	0.275	0.00	0.458	0.00	32.062	1.83	0.119	0.02
042	0.082	0.01	0.122	0.07	0.904	0.08	0.069	0.05	0.247	0.02	0.412	0.04	30.412	2.17	0.141	0.06
043	0.482	0.18	0.485	0.21	1.547	0.04	0.155	0.04	1.065	0.22	0.483	0.01	31.896	1.05	0.232	0.01
044	0.066	0.01	0.195	0.11	0.854	0.05	0.061	0.05	0.198	0.02	0.330	0.03	27.618	0.04	0.057	0.05
045	0.809	0.16	0.233	0.02	1.519	0.37	0.101	0.09	0.920	0.38	0.582	0.05	35.922	3.64	0.186	0.02
08[illegible]	0.429	0.38	0.183	0.13	1.760	0.05	0.175	0.13	0.399	0.44	0.304	0.01	30.970	0.06	0.176	0.03
0[illegible]	0.753	0.39	0.198	0.03	1.381	0.02	0.143	0.01	0.938	0.02	0.248	0.03	21.673	1.16	0.248	0.03
082	0.169	0.25	0.190	0.21	1.278	0.55	0.198	0.20	0.352	0.04	0.197	0.02	27.884	1.06	0.184	0.00
083	0.238	0.33	0.139	0.01	1.183	0.06	0.112	0.01	0.486	0.11	0.349	0.02	29.970	0.54	0.174	0.00
Ar.Mean	0.287	0.17	0.286	0.13	1.566	0.39	0.142	0.05	0.399	0.11	0.418	0.03	32.274	1.80	0.150	0.04
Std.Dev.	0.185	0.17	0.315	0.20	1.557	0.62	0.205	0.05	0.234	0.15	0.110	0.02	4.330	1.41	0.063	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 5-87

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

Location Number	PO4	d	CO3	d	HCO3	d	NH4	d	TSS	d	CU	d	Av d	SD(d)
001	0.052	0.01	2.382	0.75	5.718	1.80	0.176	0.13	17.554	4.60	13.443	0.41	0.82	1.34
002	0.051	0.01	1.932	0.82	4.636	1.96	0.246	0.12	15.714	1.46	12.482	0.62	0.62	0.94
003	0.027	0.03	3.364	0.18	8.073	0.44	0.135	0.01	18.145	0.36	13.247	0.31	0.24	0.40
004	0.018	0.00	4.560	0.42	10.944	1.01	0.182	0.02	12.600	6.12	16.141	2.52	0.75	1.69
005	0.030	0.02	4.965	0.09	11.916	0.22	0.199	0.00	15.888	0.29	16.659	4.86	0.49	1.27
006	0.021	0.00	5.295	0.09	12.708	0.22	0.212	0.00	21.198	4.60	19.258	3.48	0.78	1.42
007	0.019	0.00	4.714	0.27	11.314	0.64	0.189	0.01	11.314	0.64	14.369	3.45	0.37	0.92
008	0.025	0.03	2.955	0.45	7.091	1.09	0.118	0.02	11.000	11.09	13.545	0.91	1.08	2.91
009	0.027	0.03	3.398	0.02	8.155	0.05	0.136	0.00	17.000	6.91	13.251	0.22	0.65	1.85
010	0.025	0.00	3.148	0.39	7.555	0.93	0.126	0.02	14.518	3.04	13.850	1.70	0.62	0.89
011	0.021	0.01	3.511	0.02	8.427	0.05	0.140	0.00	25.282	0.16	13.203	0.09	0.16	0.42
012	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
013	0.037	0.02	3.125	0.02	7.500	0.05	0.125	0.00	37.459	22.23	13.750	0.10	1.79	5.90
014	0.226	0.06	3.432	0.09	8.236	0.22	0.137	0.00	45.832	22.12	9.622	2.18	2.06	5.84
015	0.014	0.00	3.477	0.14	8.345	0.33	0.139	0.01	24.000	33.82	12.365	0.91	2.61	8.99
016	0.018	0.01	2.307	0.75	5.536	1.80	0.146	0.14	15.882	14.60	12.855	2.11	1.58	3.82
017	0.024	0.00	5.985	0.15	14.364	0.36	0.239	0.01	21.135	30.45	16.646	1.61	2.42	8.08
018	0.021	0.00	5.325	0.09	12.780	0.22	0.319	0.21	17.676	24.79	15.859	2.07	2.09	6.56
019	0.041	999.99	5.100	999.99	12.240	999.99	0.204	999.99	32.640	999.99	16.932	999.99	999.99	999.99
020	0.047	0.06	4.650	0.18	11.160	0.43	0.281	0.20	26.988	2.90	21.408	2.69	0.70	0.98
021	0.018	0.00	4.540	0.08	10.896	0.19	0.182	0.00	19.961	3.28	15.803	1.01	0.52	[illegible]
022	0.019	0.00	4.647	0.19	11.154	0.45	0.186	0.01	21.284	8.43	15.607	0.11	0.92	[illegible]
023	0.237	0.06	5.910	0.42	14.184	1.01	0.236	0.02	231.840	25.92	12.179	1.10	2.67	6.84
024	0.013	0.00	3.307	0.20	7.936	0.49	0.132	0.01	13.227	0.82	13.023	0.41	0.41	0.83
025	0.112	0.02	3.000	0.55	7.200	1.31	0.120	0.02	95.564	5.24	12.545	1.09	0.69	1.37
026	0.019	0.00	4.714	0.32	11.314	0.77	0.189	0.01	24.064	24.73	16.341	2.65	2.24	6.53
027	0.019	0.00	4.815	0.15	11.556	0.36	0.193	0.01	13.452	3.43	21.186	0.66	0.72	1.55
028	0.022	0.00	5.490	0.30	13.176	0.72	0.220	0.01	21.900	3.19	17.550	0.36	0.83	1.81
030	0.192	0.08	6.060	0.60	14.544	1.44	0.473	0.44	102.528	39.17	17.270	4.13	3.84	10.25
031	0.065	0.05	4.647	0.13	11.154	0.32	0.369	0.36	14.845	3.29	15.152	0.62	0.47	0.86
032	0.019	0.00	4.821	0.48	11.571	1.16	0.193	0.02	18.273	0.10	15.033	1.12	0.33	0.48
033	0.019	0.00	4.741	0.16	11.379	0.39	0.190	0.01	16.136	2.44	14.763	2.91	0.52	0.95
034	0.018	0.00	4.540	0.19	10.896	0.45	0.182	0.01	11.786	1.33	15.626	1.37	0.29	0.48
035	0.020	0.00	5.116	0.05	12.279	0.13	0.205	0.00	11.250	1.93	15.867	2.83	0.55	1.01
036	0.018	0.00	4.567	0.03	10.961	0.06	0.183	0.00	17.330	16.34	16.438	2.10	1.57	4.31
037	0.019	0.00	4.781	0.03	11.475	0.06	0.191	0.00	23.898	5.60	15.684	0.85	0.69	1.53
038	0.021	0.00	5.145	0.39	12.348	0.94	0.206	0.02	10.590	10.50	17.431	1.97	1.33	2.81
039	0.019	0.00	4.755	0.21	11.412	0.50	0.190	0.01	15.216	0.67	14.908	1.43	0.39	0.70
040	0.021	0.01	3.568	0.00	8.564	0.00	0.143	0.00	39.964	14.27	14.273	0.00	1.09	3.80
041	0.018	0.00	4.580	0.00	10.993	0.00	0.183	0.00	17.405	9.16	17.497	1.28	0.94	2.44
042	0.016	0.00	4.125	0.38	9.900	0.90	0.165	0.01	21.225	7.95	15.307	0.26	0.86	2.12
043	0.068	0.02	4.835	0.13	11.604	0.32	0.291	0.20	31.923	2.82	15.962	1.41	0.48	0.79
044	0.013	0.00	3.295	0.32	7.909	0.76	0.132	0.01	9.882	12.85	13.395	0.81	1.08	3.40
045	0.023	0.00	5.820	0.54	13.968	1.30	0.233	0.02	20.736	7.37	16.496	0.14	1.01	2.07
080	0.036	0.00	3.037	0.13	7.290	0.30	0.240	0.23	19.390	4.06	15.795	0.65	0.47	[illegible]
081	0.030	0.02	2.477	0.32	5.945	0.76	0.145	0.08	21.336	3.73	10.373	0.35	0.50	[illegible]
082	0.016	0.02	1.969	0.24	4.725	0.58	0.236	0.03	22.693	1.93	14.545	1.00	0.44	[illegible]
083	0.014	0.00	3.487	0.22	8.370	0.54	0.211	0.15	21.690	5.58	15.345	0.99	0.61	1.46
Ar.Mean	0.040	0.01	4.179	0.25	10.030	0.61	0.197	0.06	27.898	9.05	15.112	1.39	1.01	2.58
Std.dev.	0.051	0.02	1.097	0.21	2.633	0.51	0.067	0.10	35.234	9.90	2.327	1.16	0.78	2.49

ARIZONA PUBLIC SERVICE
MONTHLY REPORT for 5-87

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/SAMPLES SPILLED	VOID/SAMPLES SPILLED	MISSING SAMPLE A and B
013			
014			
015			
016			
017			
018			
019	SCREEN NOT IN PLACE	VOID/DEAD BIRD IN JAR	MISSING SAMPLE B
020			
021			
022			
023	LIQUID DIRTY AND CLOUDY	LIQUID DIRTY AND CLOUDY	
024			
025	LIQUID CLOUDY	LIQUID CLOUDY	
026			
027			
028			
030	BIRD DROPPINGS AND INSECT PARTS ON SCREEN	BIRD DROPPINGS AND INSECT PARTS ON SCREEN	
031			
032			
033			
034			
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036			
037			
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083			

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

MONTHLY REPORT for 6-87

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	0.425	0.03	0.337	0.15	1.034	0.66	0.212	0.11	0.425	0.03	0.195	0.05	1.953	0.49	0.020	0.0
002	0.560	0.07	0.437	0.03	0.987	0.27	0.240	0.09	0.475	0.10	0.200	0.02	2.000	0.25	0.138	0.0
003	0.278	0.00	0.347	0.00	0.764	0.13	0.181	0.04	0.278	0.00	0.174	0.00	1.737	0.02	0.017	0.0
004	0.380	0.12	0.434	0.02	1.082	0.18	0.152	0.02	0.242	0.15	0.271	0.01	2.710	0.10	0.027	0.0
005	0.331	0.02	0.498	0.15	1.377	0.01	0.242	0.03	0.165	0.01	0.276	0.02	2.758	0.19	0.028	0.0
006	0.384	0.15	0.550	0.27	2.349	0.56	0.373	0.08	0.487	0.06	0.272	0.03	2.722	0.27	0.027	0.0
007	0.430	0.17	0.616	0.31	1.097	0.12	0.182	0.03	0.183	0.02	0.305	0.03	3.048	0.34	0.030	0.0
008	0.309	0.04	0.593	0.37	0.798	0.04	0.173	0.02	0.309	0.04	0.224	0.04	2.237	0.38	0.022	0.0
009	0.520	0.09	0.711	0.48	0.946	0.01	0.217	0.05	0.277	0.20	0.266	0.06	2.662	0.62	0.027	0.0
010	0.395	0.03	0.632	0.05	1.144	0.01	0.312	0.02	0.316	0.02	0.197	0.01	1.975	0.15	0.020	0.0
011	0.542	0.01	0.883	0.43	1.627	0.31	0.366	0.02	0.203	0.00	0.339	0.01	3.387	0.07	0.034	0.0
012	0.330	0.03	0.828	0.24	1.112	0.01	0.371	0.00	0.247	0.02	0.206	0.02	2.062	0.17	0.021	0.0
013	0.428	999.99	1.391	999.99	1.605	999.99	0.407	999.99	0.160	999.99	0.267	999.99	2.675	999.99	0.027	999.9
014	0.465	0.16	0.466	0.32	7.567	3.58	0.919	0.35	0.426	0.08	0.194	0.00	1.937	0.02	0.101	0.0
015	0.253	0.14	0.298	0.05	0.855	0.07	0.207	0.04	0.230	0.19	0.215	0.02	2.150	0.25	0.021	0.0
016	0.288	0.02	0.255	0.05	0.688	0.14	0.185	0.01	0.382	0.09	0.111	0.06	1.112	0.57	0.060	0.0
017	0.563	0.11	0.814	0.11	0.814	0.11	0.144	0.03	0.627	0.01	0.313	0.01	3.133	0.07	0.031	0.0
018	0.279	0.19	0.557	0.00	0.650	0.00	0.149	0.04	0.139	0.00	0.232	0.00	2.323	0.00	0.023	0.0
019	0.458	0.21	0.834	0.02	0.705	0.01	0.193	0.01	0.194	0.03	0.323	0.06	3.230	0.56	0.032	0.0
020	0.470	0.07	0.601	0.19	0.642	0.06	0.171	0.01	0.472	0.10	0.214	0.01	2.141	0.07	[illegible]	0.0
021	0.432	0.03	0.804	0.27	0.808	0.06	0.210	0.02	0.162	0.01	0.270	0.02	2.698	0.17	[illegible]	0.0
022	0.402	0.12	0.745	0.10	0.745	0.10	0.189	0.01	0.172	0.00	0.287	0.01	2.867	0.07	[illegible]	0.0
023	1.476	0.07	3.834	0.12	11.069	0.51	4.846	1.84	1.105	0.10	0.369	0.02	3.690	0.17	0.230	0.1
024	0.318	0.01	0.780	0.10	0.584	0.13	0.076	0.03	0.139	0.03	0.231	0.06	2.312	0.58	0.033	0.0
025	0.417	0.13	1.476	0.12	3.546	0.01	1.594	0.12	0.428	0.09	0.267	0.05	2.675	0.55	0.131	0.1
026	0.369	0.02	0.503	0.77	0.499	0.52	0.196	0.01	0.184	0.01	0.307	0.02	3.073	0.19	0.031	0.0
027	0.293	0.00	0.586	0.20	0.831	0.10	0.225	0.00	0.147	0.00	0.244	0.00	2.444	0.00	0.024	0.0
028	0.259	0.07	0.510	0.35	1.148	0.05	0.150	0.03	0.157	0.02	0.262	0.04	2.625	0.36	0.026	0.0
030	1.292	0.42	2.157	0.60	6.822	2.19	1.636	1.06	1.447	0.11	0.364	0.05	3.641	0.46	0.518	0.6
031	1.515	0.07	1.164	0.47	5.429	2.96	1.369	0.88	2.303	0.66	0.200	0.01	1.996	0.12	0.262	0.0
032	0.409	0.53	0.501	0.57	0.816	0.84	0.165	0.19	0.308	0.51	0.186	0.19	1.856	1.90	0.019	0.0
033	0.275	0.01	0.469	0.01	0.676	0.13	0.153	0.01	0.120	0.04	0.201	0.06	2.008	0.63	0.020	0.0
034	0.370	0.04	0.593	0.21	0.584	0.01	0.093	0.05	0.160	0.03	0.267	0.05	2.673	0.46	0.027	0.0
035	0.511	0.16	0.580	0.27	0.728	0.02	0.181	0.07	0.218	0.01	0.364	0.01	3.641	0.12	0.036	0.0
036	0.226	0.21	0.281	0.32	0.810	0.07	0.198	0.06	0.173	0.02	0.289	0.03	2.891	0.27	0.029	0.0
037	0.432	0.15	0.495	0.28	0.555	0.16	0.104	0.03	0.184	0.01	0.307	0.02	3.073	0.19	0.031	0.0
038	0.765	0.04	0.606	0.09	0.933	0.38	0.238	0.09	0.718	0.14	0.256	0.05	2.565	0.48	0.026	0.0
039	0.408	0.06	0.637	0.04	0.640	0.22	0.164	0.05	0.247	0.21	0.227	0.01	2.274	0.15	0.053	0.0
040	0.386	0.08	0.708	0.13	1.201	0.17	0.418	0.11	0.145	0.03	0.241	0.05	2.412	0.53	0.024	0.0
041	0.373	0.08	0.752	0.26	0.855	0.05	0.214	0.01	0.373	0.08	0.267	0.02	2.673	0.17	0.027	0.0
042	0.229	0.12	0.386	0.10	0.507	0.00	0.102	0.03	0.257	0.07	0.161	0.04	1.609	0.41	0.037	0.0
043	0.494	0.24	0.592	0.29	1.099	0.26	0.256	0.00	0.667	0.14	0.247	0.12	2.468	1.21	0.045	0.0
044	0.208	0.00	0.522	0.43	0.779	0.09	0.229	0.03	0.156	0.00	0.260	0.01	2.600	0.05	0.026	0.0
045	1.019	0.63	0.565	0.43	0.966	0.29	0.170	0.08	1.136	0.40	0.285	0.01	2.855	0.15	0.029	0.0
080	0.592	0.14	0.679	0.03	1.694	0.09	0.301	0.01	0.594	0.03	0.212	0.01	2.121	0.10	[illegible]	0.0
081	0.490	0.08	0.320	0.17	0.996	0.01	0.240	0.07	0.610	0.04	0.130	0.03	1.300	0.35	[illegible]	0.0
082	0.251	0.09	0.249	0.29	1.961	0.22	0.394	0.30	0.403	0.02	0.252	0.01	2.518	0.11	0.025	0.0
083	0.356	0.32	0.100	0.01	1.551	0.20	0.244	0.08	0.401	0.02	0.251	0.02	2.509	0.16	0.090	0.0
Ar.Mean	0.472	0.12	0.702	0.22	1.597	0.34	0.412	0.13	0.403	0.09	0.250	0.03	2.500	0.31	0.056	0.0
Std.Dev.	0.288	0.13	0.576	0.18	2.032	0.72	0.739	0.32	0.394	0.13	0.057	0.03	0.566	0.33	0.084	0.0

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

Location Number	PO4	d	CO3	d	HCO3	d	NH4	d	TSS	d	CU	d	Av d	SD(d)
001	0.031	0.01	1.953	0.49	5.710	0.87	0.146	0.12	4.172	3.95	0.156	0.04	0.50	1.03
002	0.028	0.00	2.000	0.25	5.925	1.65	0.080	0.01	5.937	7.62	0.059	0.03	0.75	2.02
003	0.007	0.00	1.737	0.02	4.170	0.06	0.069	0.00	3.662	3.87	0.173	0.21	0.31	1.03
004	0.011	0.00	2.710	0.10	6.503	0.23	0.108	0.00	2.710	0.10	0.134	0.16	0.08	0.08
005	0.011	0.00	2.758	0.19	6.619	0.46	0.110	0.01	8.787	1.59	0.082	0.05	0.20	0.42
006	0.011	0.00	2.722	0.27	12.082	5.53	0.109	0.01	17.777	5.86	0.161	0.09	0.94	2.02
007	0.012	0.00	3.048	0.34	5.301	4.84	0.122	0.01	3.048	0.34	0.205	0.28	0.49	1.26
008	0.009	0.00	2.237	0.38	3.935	3.77	0.089	0.02	7.010	2.38	0.065	0.03	0.54	1.12
009	0.011	0.00	2.662	0.62	4.745	4.79	0.106	0.02	7.800	1.32	0.077	0.03	0.59	1.27
010	0.008	0.00	1.975	0.15	3.305	2.51	0.079	0.01	12.320	4.88	0.117	0.07	0.56	1.41
011	0.014	0.00	3.387	0.07	8.130	0.18	0.135	0.00	21.710	5.90	0.068	0.00	0.50	1.56
012	0.017	0.02	2.062	0.17	4.950	0.42	0.082	0.01	17.360	3.12	0.061	0.04	0.30	0.82
013	0.011	999.99	2.675	999.99	6.420	999.99	0.107	999.99	16.050	999.99	0.053	999.99	999.99	999.99
014	0.299	0.09	1.937	0.02	27.940	12.76	0.077	0.00	18.240	8.76	0.232	0.00	1.87	3.96
015	0.013	0.01	2.150	0.25	5.160	0.60	0.086	0.01	7.640	2.54	0.131	0.10	0.31	0.66
016	0.021	0.00	1.112	0.57	2.670	1.38	0.044	0.02	7.385	0.91	0.150	0.04	0.28	0.42
017	0.013	0.00	3.133	0.07	7.519	0.17	0.125	0.00	3.133	0.07	0.156	0.18	0.07	0.06
018	0.009	0.00	2.323	0.00	3.948	3.25	0.093	0.00	2.323	0.00	0.139	0.09	0.25	0.86
019	0.020	0.02	3.230	0.56	5.296	3.58	0.129	0.02	3.230	0.56	0.100	0.08	0.41	0.94
02[illegible]	0.009	0.00	2.141	0.07	3.665	3.12	0.086	0.00	7.331	6.24	0.345	0.35	0.74	1.78
0[illegible]	0.011	0.00	2.698	0.17	4.527	3.49	0.108	0.01	2.698	0.17	0.054	0.00	0.32	0.92
02[illegible]	0.011	0.00	2.867	0.07	4.848	3.89	0.115	0.00	2.867	0.07	0.057	0.00	0.32	1.03
023	0.111	0.01	3.690	0.17	46.471	0.66	0.148	0.01	324.339	14.61	0.295	0.01	1.31	3.86
024	0.009	0.00	2.312	0.58	4.132	4.21	0.092	0.02	2.312	0.58	0.185	0.05	0.46	1.11
025	0.063	0.01	2.675	0.55	16.200	4.08	0.107	0.02	69.640	77.84	0.214	0.04	5.98	20.71
026	0.012	0.00	3.073	0.19	5.156	3.97	0.123	0.01	5.291	4.63	0.093	0.07	0.74	1.53
027	0.034	0.05	2.444	0.00	5.865	0.00	0.098	0.00	2.444	0.00	0.293	0.20	0.04	0.07
028	0.020	0.02	2.625	0.36	4.335	3.06	0.105	0.01	7.756	9.90	0.154	0.08	1.03	2.68
030	0.179	0.08	3.641	0.46	27.121	13.98	0.223	0.17	130.621	1.98	0.223	0.17	1.60	3.63
031	0.064	0.01	1.996	0.12	24.484	10.26	0.240	0.01	67.403	79.06	0.080	0.00	6.76	20.99
032	0.013	0.02	1.856	1.90	2.489	0.63	0.243	0.41	2.670	0.27	0.064	0.02	0.57	0.62
033	0.008	0.00	2.008	0.63	3.194	1.74	0.080	0.03	5.748	3.37	0.040	0.01	0.48	0.96
034	0.011	0.00	2.673	0.46	2.673	0.46	0.107	0.02	6.339	6.87	0.156	0.08	0.62	1.81
035	0.015	0.00	3.641	0.12	6.148	4.89	0.146	0.00	8.453	9.75	0.073	0.00	1.10	2.80
036	0.012	0.00	2.891	0.27	2.891	0.27	0.116	0.01	7.028	8.01	0.209	0.31	0.70	2.11
037	0.012	0.00	3.073	0.19	3.073	0.19	0.123	0.01	5.156	3.97	0.093	0.07	0.38	1.04
038	0.010	0.00	2.565	0.48	4.529	4.41	0.103	0.02	6.513	7.41	0.103	0.02	0.97	2.18
039	0.009	0.00	2.274	0.15	3.917	3.43	0.091	0.01	2.274	0.15	0.091	0.01	0.32	0.90
040	0.010	0.00	2.412	0.53	5.790	1.26	0.096	0.02	29.695	11.23	0.096	0.02	1.01	2.96
041	0.021	0.02	2.673	0.17	4.485	3.45	0.107	0.01	2.673	0.17	0.136	0.17	0.33	0.90
042	0.006	0.00	1.609	0.41	1.609	0.41	0.064	0.02	3.714	3.80	0.120	0.10	0.40	0.99
043	0.043	0.06	2.468	1.21	5.923	2.90	0.248	0.25	9.360	12.58	0.136	0.03	1.38	3.32
044	0.010	0.00	2.600	0.05	6.240	0.12	0.104	0.00	4.437	3.72	0.052	0.00	0.32	0.99
045	0.011	0.00	2.855	0.15	4.802	3.75	0.114	0.01	7.585	9.31	0.284	0.10	1.09	2.56
08[illegible]	0.008	0.00	2.121	0.10	7.634	0.37	0.085	0.00	6.466	8.59	0.211	0.07	0.68	2.28
0[illegible]	0.016	0.02	1.300	0.35	3.795	0.51	0.097	0.08	10.120	1.36	0.126	0.02	0.22	0.36
082	0.040	0.02	2.518	0.11	7.521	2.70	0.199	0.19	10.693	11.53	0.152	0.11	1.12	3.08
083	0.010	0.00	2.509	0.16	7.572	3.48	0.100	0.01	9.072	12.97	0.128	0.16	1.26	3.49
Ar.Mean	0.028	0.01	2.500	0.31	7.530	2.82	0.116	0.03	19.396	7.74	0.137	0.08	0.88	2.40
Std.dev.	0.050	0.02	0.566	0.33	8.102	3.05	0.045	0.08	50.039	15.62	0.073	0.08	1.24	4.07

ARIZONA PUBLIC SERVICE
MONTHLY REPORT for 6-87

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		VOID/CONTAMINATION	MISSING SAMPLE B
014			
015			
016			
017			
018			
019			
020			
021			
022			
023			
024			
025	LIQUID DIRTY	LIQUID DIRTY	
026			
027			
028			
030			
031	LIQUID DIRTY	LIQUID DIRTY	
032			
033		SCREEN DISPLACED	
034			
035			
036			
037			
038			
039			
040			
041			
042			
043	SCREEN DISPLACED		
044			
045			
080			
081			
082			
083			

A R I Z O N A   P U B L I C   S E R V I C E
MONTHLY REPORT for 7-87

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	0.714	0.18	0.306	0.01	3.843	0.97	0.806	0.12	0.469	0.07	0.204	0.10	2.036	0.96	0.352	0.02
002	0.494	0.49	0.385	0.47	2.227	0.02	0.494	0.02	0.470	0.05	0.340	0.06	3.402	0.59	0.298	0.02
003	0.385	0.47	0.304	0.01	2.130	0.09	0.555	0.02	0.414	0.36	0.380	0.02	3.804	0.16	0.175	0.01
004	0.520	0.21	0.156	0.10	1.873	0.83	0.172	0.03	0.234	0.16	0.260	0.00	2.602	0.00	0.114	0.02
005	0.299	0.41	0.146	0.09	1.761	0.11	0.328	0.01	0.392	0.02	0.245	0.01	2.449	0.12	0.176	0.01
006	0.433	0.20	0.382	0.12	4.285	1.05	0.864	0.02	0.706	0.08	0.272	0.01	2.719	0.09	0.169	0.04
007	0.122	0.15	0.144	0.09	3.150	1.54	0.252	0.08	0.145	0.00	0.242	0.01	2.415	0.07	0.125	0.05
008	0.207	0.26	0.235	0.13	1.671	0.04	0.375	0.03	0.352	0.20	0.399	0.05	3.991	0.48	0.197	0.06
009	0.147	0.10	0.294	0.19	2.354	0.42	0.500	0.03	0.294	0.00	0.490	0.01	4.902	0.05	0.265	0.02
010	0.115	0.09	0.287	0.25	1.862	0.16	0.364	0.02	0.448	0.07	0.374	0.06	3.737	0.62	0.292	0.06
011	0.281	0.27	0.496	0.12	3.621	0.28	0.877	0.34	0.321	0.22	0.355	0.01	3.549	0.13	0.212	0.05
012	0.434	0.37	3.158	1.14	10.650	3.56	3.158	1.14	0.433	0.13	0.309	0.00	3.094	0.03	0.297	0.12
013	0.249	0.18	0.409	0.14	2.871	0.32	0.699	0.02	0.446	0.38	0.411	0.02	4.112	0.24	0.271	0.03
014	0.297	0.02	0.297	0.02	21.429	2.74	2.814	0.07	0.415	0.40	0.371	0.03	3.710	0.29	0.112	0.15
015	0.196	0.24	0.228	0.14	1.994	0.18	0.322	0.01	0.231	0.01	0.384	0.02	3.844	0.24	0.098	0.12
016	1.282	0.12	0.427	0.37	3.420	1.71	0.476	0.24	1.160	0.37	0.305	0.00	3.054	0.00	0.256	0.02
017	0.185	0.13	0.246	0.00	1.350	0.22	0.233	0.00	0.339	0.31	0.307	0.00	3.070	0.05	0.096	0.13
018	0.274	0.12	0.272	0.10	1.691	0.28	0.393	0.06	0.164	0.00	0.273	0.01	2.730	0.07	0.180	0.03
019	0.443	0.29	0.401	0.10	2.154	0.79	0.542	0.15	0.200	0.05	0.334	0.08	3.340	0.82	0.169	0.04
02[illegible]	0.517	0.37	0.254	0.16	1.702	0.25	0.272	0.09	0.595	0.14	0.427	0.02	4.266	0.23	0.212	0.07
0[illegible]	0.092	0.01	0.233	0.13	1.278	0.01	0.229	0.08	0.286	0.28	0.229	0.04	2.294	0.35	0.223	0.01
022	0.062	0.04	0.296	0.26	1.216	0.14	0.180	0.00	0.190	0.13	0.210	0.01	2.096	0.09	0.172	0.00
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	0.118	0.08	0.551	0.47	3.307	0.63	0.598	0.38	0.236	0.00	0.394	0.00	3.937	0.00	0.189	0.13
025	0.271	0.36	1.138	0.14	5.031	0.81	1.444	0.43	0.733	0.04	0.411	0.07	4.112	0.67	0.317	0.03
026	0.068	0.05	0.130	0.07	1.147	0.03	0.133	0.02	0.307	0.05	0.222	0.03	2.217	0.29	0.181	0.00
027	0.182	0.27	0.146	0.08	1.378	0.21	0.186	0.05	0.298	0.04	0.248	0.03	2.484	0.33	0.203	0.02
028	0.176	0.26	0.384	0.05	6.252	0.98	0.498	0.01	0.257	0.21	0.240	0.03	2.402	0.30	0.098	0.15
030	0.689	0.58	1.906	0.18	7.087	0.20	2.179	0.17	1.158	0.08	0.341	0.02	3.410	0.16	0.369	0.07
031	0.437	0.47	0.783	0.36	8.382	2.28	0.841	0.43	0.785	0.16	0.246	0.01	2.460	0.11	0.315	0.01
032	0.368	0.63	0.626	0.63	4.331	1.44	0.518	0.23	0.540	0.46	0.236	0.04	2.360	0.44	0.167	0.02
033	0.095	0.11	0.266	0.23	1.062	0.30	0.156	0.02	0.171	0.11	0.190	0.00	1.897	0.00	0.125	0.01
034	0.041	0.00	0.245	0.00	1.021	0.26	0.171	0.01	0.183	0.12	0.204	0.00	2.040	0.02	0.167	0.01
035	0.053	0.00	0.369	0.08	1.256	0.76	0.299	0.12	0.159	0.01	0.265	0.02	2.647	0.18	0.127	0.01
036	0.037	0.00	0.187	0.08	0.857	0.04	0.150	0.05	0.169	0.12	0.186	0.01	1.864	0.07	0.145	0.01
037	0.049	0.00	0.296	0.02	0.746	0.35	0.144	0.06	0.148	0.01	0.247	0.02	2.471	0.18	0.118	0.01
038	0.056	0.01	0.172	0.13	0.900	0.12	0.172	0.03	0.169	0.02	0.281	0.04	2.812	0.37	0.162	0.01
039	0.053	0.01	0.309	0.17	0.900	0.22	0.184	0.01	0.158	0.02	0.264	0.04	2.637	0.35	0.131	0.01
040	0.210	0.24	0.513	0.03	2.051	0.12	0.401	0.03	0.256	0.01	0.427	0.02	4.272	0.24	0.063	0.04
041	0.227	0.09	0.317	0.27	1.318	0.12	0.214	0.00	0.409	0.08	0.227	0.00	2.272	0.04	0.236	0.00
042	0.075	0.06	0.240	0.06	1.295	0.26	0.293	0.06	0.258	0.20	0.244	0.04	2.437	0.42	0.144	0.03
043	0.367	0.29	0.563	0.24	1.811	0.31	0.429	0.00	0.759	0.19	0.245	0.06	2.449	0.62	0.119	0.05
044	0.071	0.01	0.424	0.03	2.268	0.45	0.517	0.08	0.314	0.19	0.354	0.03	3.536	0.27	0.154	0.07
045	1.098	0.11	0.476	0.43	4.434	1.05	0.402	0.05	0.902	0.50	0.307	0.04	3.070	0.38	0.141	0.00
0[illegible]	1.228	0.06	0.464	0.41	5.591	0.12	0.749	0.18	1.102	0.19	0.212	0.00	2.118	0.04	0.191	0.11
08[illegible]	2.710	0.29	0.523	0.09	2.496	0.72	0.462	0.24	2.698	0.55	0.327	0.06	3.268	0.59	0.393	0.05
082	0.386	0.15	0.478	0.33	2.759	0.73	0.474	0.14	0.536	0.03	0.245	0.03	2.449	0.30	0.243	0.03
083	0.429	0.07	0.238	0.08	2.007	0.06	0.376	0.08	0.574	0.04	0.239	0.02	2.393	0.15	0.182	0.01
Ar.Mean	0.367	0.19	0.449	0.19	3.154	0.60	0.572	0.12	0.468	0.15	0.296	0.03	2.962	0.26	0.195	0.04
Std.Dev.	0.455	0.17	0.497	0.20	3.419	0.74	0.629	0.19	0.426	0.15	0.076	0.02	0.757	0.23	0.078	0.04

ARIZONA PUBLIC SERVICE
MONTHLY REPORT for 7-87

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

Location Number	PO4	d	CO3	d	HCO3	d	NH4	d	TSS	d	CU	d	Av d	SD(d)
001	0.151	0.02	2.036	0.96	15.161	7.95	0.081	0.04	30.557	11.40	0.306	0.01	1.63	3.50
002	0.079	0.04	3.402	0.59	11.893	6.04	0.260	0.22	10.382	5.85	0.198	0.10	1.04	2.09
003	0.053	0.02	3.804	0.16	9.129	0.39	0.152	0.01	19.130	11.45	0.113	0.07	0.95	3.03
004	0.010	0.00	2.602	0.00	6.244	0.00	0.104	0.00	3.902	2.60	0.052	0.00	0.28	0.70
005	0.024	0.01	2.449	0.12	7.383	3.29	0.194	0.19	15.244	5.63	0.146	0.09	0.72	1.65
006	0.065	0.02	2.719	0.09	13.050	0.45	0.109	0.00	41.784	8.34	0.164	0.11	0.76	2.20
007	0.019	0.02	2.415	0.07	13.553	4.24	0.097	0.00	27.834	44.23	0.048	0.00	3.61	11.75
008	0.016	0.00	3.991	0.48	9.579	1.16	0.394	0.11	18.804	30.11	0.080	0.01	2.37	7.99
009	0.059	0.00	4.902	0.05	14.721	6.04	0.294	0.19	16.693	9.99	0.147	0.10	1.23	2.98
010	0.050	0.04	3.737	0.62	8.968	1.48	0.367	0.09	13.848	20.84	0.218	0.11	1.75	5.51
011	0.113	0.05	3.549	0.13	12.857	9.00	0.142	0.01	42.161	43.82	0.212	0.13	3.90	11.73
012	0.687	0.04	3.094	0.03	37.162	17.65	0.371	0.00	272.518	126.11	0.496	0.25	10.76	33.52
013	0.116	0.07	4.112	0.24	9.868	0.58	0.244	0.15	30.595	13.30	0.164	0.01	1.12	3.51
014	0.768	0.15	3.710	0.29	66.541	6.57	0.148	0.01	28.912	36.22	1.039	0.08	3.36	9.63
015	0.039	0.02	3.844	0.24	9.225	0.58	0.154	0.01	12.962	18.48	0.077	0.00	1.45	4.90
016	0.092	0.04	3.054	0.00	9.161	3.66	0.122	0.00	10.687	15.27	0.092	0.06	1.56	4.07
017	0.012	0.00	3.070	0.05	7.369	0.11	0.123	0.00	7.092	8.09	0.061	0.00	0.65	2.14
018	0.044	0.02	2.730	0.07	6.553	0.17	0.109	0.00	18.581	2.66	0.055	0.00	0.26	0.70
019	0.094	0.02	3.340	0.82	8.016	1.97	0.192	0.08	31.828	6.66	0.067	0.02	0.85	1.76
020	0.025	0.02	4.266	0.23	10.237	0.56	0.254	0.16	6.457	4.62	0.085	0.00	0.49	1.20
021	0.022	0.02	2.294	0.35	5.506	0.85	0.409	0.03	7.624	3.39	0.046	0.01	0.40	[illegible]
022	0.008	0.00	2.096	0.09	5.029	0.21	0.084	0.00	6.724	1.96	0.062	0.04	0.21	[illegible]
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	0.063	0.09	3.937	0.00	11.812	4.72	0.157	0.00	37.800	31.50	0.118	0.08	2.72	8.37
025	0.239	0.06	4.112	0.67	19.736	3.21	0.164	0.03	122.448	42.14	0.240	0.12	3.49	11.16
026	0.017	0.02	2.217	0.29	5.321	0.69	0.130	0.07	6.207	0.80	0.044	0.01	0.17	0.26
027	0.019	0.02	2.484	0.33	5.962	0.79	0.345	0.05	11.466	12.34	0.152	0.12	1.05	3.26
028	0.062	0.02	2.402	0.30	14.948	11.50	0.096	0.01	52.622	29.64	0.192	0.02	3.11	8.21
030	0.693	0.18	3.410	0.16	17.264	18.55	1.980	0.23	143.391	20.53	0.273	0.01	2.94	7.05
031	0.394	0.39	2.460	0.11	26.475	6.68	0.446	0.32	75.424	26.12	0.121	0.14	2.69	6.97
032	0.099	0.09	2.360	0.44	13.897	3.02	0.308	0.41	44.925	29.97	0.069	0.03	2.71	7.89
033	0.076	0.11	1.897	0.00	4.553	0.00	0.114	0.08	11.003	3.79	0.057	0.04	0.34	1.00
034	0.020	0.01	2.040	0.02	4.897	0.05	0.082	0.00	18.768	1.43	0.082	0.00	0.14	0.38
035	0.037	0.03	2.647	0.18	6.353	0.42	0.106	0.01	31.959	17.96	0.079	0.05	1.42	4.77
036	0.015	0.00	1.864	0.07	4.474	0.16	0.075	0.00	16.796	2.83	0.075	0.00	0.25	0.75
037	0.010	0.00	2.471	0.18	5.929	0.42	0.099	0.01	12.582	13.73	0.126	0.16	1.08	3.64
038	0.011	0.00	2.812	0.37	6.750	0.90	0.112	0.01	7.800	1.20	0.056	0.01	0.23	0.37
039	0.016	0.01	2.637	0.35	6.328	0.84	0.105	0.01	14.695	0.14	0.077	0.04	0.16	0.23
040	0.025	0.02	4.272	0.24	10.254	0.58	0.171	0.01	22.854	14.08	0.129	0.09	1.13	3.73
041	0.045	0.07	2.272	0.04	5.453	0.11	0.453	0.35	12.724	0.25	0.068	0.05	0.11	0.11
042	0.043	0.00	2.437	0.42	5.850	1.01	0.097	0.02	18.551	7.46	0.071	0.04	0.72	1.96
043	0.268	0.34	2.449	0.62	5.876	1.48	1.786	2.25	31.826	0.32	0.098	0.02	0.49	0.63
044	0.071	0.01	3.536	0.27	17.293	18.26	0.141	0.01	30.579	25.93	0.105	0.06	3.26	8.12
045	0.025	0.00	3.070	0.38	13.008	5.26	0.123	0.01	18.347	0.21	0.061	0.01	0.60	1.37
080	0.110	0.00	2.118	0.04	19.482	0.41	0.127	0.08	38.091	4.29	0.127	0.08	0.43	[illegible]
081	0.094	0.07	3.268	0.59	11.411	5.72	0.250	0.21	31.382	22.86	0.190	0.10	2.30	[illegible]
082	0.164	0.20	2.449	0.30	11.756	1.46	0.478	0.33	36.464	4.25	0.196	0.02	0.59	1.12
083	0.038	0.02	2.393	0.15	8.524	5.19	0.096	0.01	24.335	3.21	0.117	0.14	0.66	1.55
Ar.Mean	0.111	0.05	2.962	0.26	11.932	3.50	0.265	0.12	32.922	15.91	0.146	0.06	1.53	4.38
Std.dev.	0.176	0.08	0.757	0.23	10.203	4.76	0.364	0.33	44.531	20.73	0.157	0.06	1.77	5.49

A R I Z O N A   P U B L I C   S E R V I C E
MONTHLY REPORT for 7-87

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	RELOCATED APPROX 300 YDS TO NORTH	RELOCATED APPROX 300 YDS TO NORTH	
012			
013			
014			
015			
016			
017			
018			
019			
020			
021			
022			
023	NO ACCESS TO COLLECT SAMPLE	NO ACCESS TO COLLECT SAMPLE	MISSING SAMPLE A and B
024			
025			
026			
027			
028			
030	SCREEN MISSING		
031			
032	SCREEN MISSING		
033			
034			
035			
036			
037			
038			
039			
040			
041			
042			
043	SCREEN MISSING		
044			
045			
080			
081			
082			
083			

A R I Z O N A   P U B L I C   S E R V I C E
MONTHLY REPORT for 8-87

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	0.706	0.13	0.118	0.02	1.220	0.13	0.087	0.02	0.257	0.13	0.294	0.05	2.943	0.52	0.181	0.0
002	0.685	0.08	0.211	0.01	1.158	0.17	0.111	0.01	0.236	0.15	0.264	0.01	2.636	0.09	0.216	0.0
003	0.555	0.10	0.202	0.00	1.009	0.01	0.091	0.02	0.277	0.25	0.252	0.00	2.523	0.02	0.136	0.0
004	0.641	0.10	0.197	0.00	1.085	0.21	0.069	0.02	0.148	0.00	0.247	0.00	2.466	0.02	0.138	0.0
005	0.592	0.04	0.146	0.09	1.034	0.03	0.064	0.03	0.267	0.23	0.247	0.02	2.466	0.16	0.167	0.0
006	0.796	0.05	0.161	0.12	1.328	0.02	0.096	0.03	0.319	0.02	0.266	0.02	2.659	0.18	0.091	0.1
007	0.557	0.02	0.190	0.06	1.820	0.09	0.087	0.02	0.203	0.08	0.238	0.07	2.379	0.72	0.142	0.2
008	0.759	0.02	0.235	0.03	1.228	0.04	0.139	0.03	0.176	0.02	0.293	0.04	2.932	0.36	0.146	0.0
009	0.792	0.21	0.361	0.17	1.434	0.11	0.158	0.01	0.215	0.02	0.359	0.03	3.585	0.28	0.186	0.0
010	1.023	0.08	0.227	0.02	1.373	0.56	0.115	0.08	0.170	0.01	0.284	0.02	2.841	0.23	0.188	0.0
011	0.687	0.02	0.229	0.01	1.260	0.03	0.132	0.04	0.172	0.00	0.286	0.01	2.864	0.07	0.149	0.0
012	1.325	0.23	0.542	0.12	2.711	0.62	0.331	0.01	0.602	0.00	0.301	0.00	3.011	0.02	0.181	0.0
013	0.810	0.10	0.252	0.07	1.619	0.21	0.112	0.01	0.324	0.22	0.315	0.09	3.148	0.89	0.160	0.0
014	0.814	0.43	0.153	0.11	4.113	1.23	0.224	0.09	0.227	0.15	0.253	0.01	2.534	0.07	0.218	0.0
015	0.635	0.03	0.160	0.11	1.064	0.47	0.051	0.05	0.237	0.15	0.265	0.01	2.648	0.11	0.159	0.0
016	0.618	0.09	0.169	0.04	1.194	0.03	0.078	0.01	0.380	0.12	0.172	0.03	1.716	0.25	0.211	0.0
017	0.750	0.05	0.190	0.14	1.310	0.04	0.069	0.04	0.187	0.01	0.312	0.02	3.125	0.20	0.200	0.0
018	0.601	0.54	0.110	0.00	0.876	0.01	0.027	0.00	0.410	0.49	0.274	0.00	2.739	0.02	0.126	0.0
019	0.925	0.09	0.314	0.10	1.403	0.34	0.134	0.02	0.374	0.22	0.261	0.08	2.614	0.82	0.168	0.0
020	0.591	0.16	0.127	0.09	1.057	0.11	0.063	0.01	0.423	0.01	0.211	0.00	2.114	0.05	0.143	0.1
021	0.956	0.01	0.239	0.24	1.375	0.61	0.102	0.06	0.358	0.00	0.299	0.00	2.987	0.03	[illegible]	0.0
022	0.870	0.15	0.116	0.00	0.986	0.15	0.049	0.04	0.321	0.30	0.290	0.01	2.897	0.10	[illegible]	0.0
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	999.9
024	0.559	999.99	0.671	999.99	3.802	999.99	0.492	999.99	0.168	999.99	0.280	999.99	2.795	999.99	0.190	999.9
025	0.655	0.05	0.592	0.18	2.499	0.23	0.390	0.15	0.336	0.33	0.299	0.03	2.989	0.30	0.299	0.0
026	0.814	0.13	0.125	0.00	1.127	0.00	0.053	0.04	0.282	0.19	0.313	0.00	3.129	0.00	0.275	0.0
027	0.545	0.23	0.127	0.09	1.052	0.12	0.169	0.07	0.233	0.22	0.210	0.01	2.102	0.07	0.232	0.0
028	0.950	0.50	0.100	0.00	2.750	0.30	0.055	0.01	0.700	0.60	0.250	0.00	2.500	0.00	0.215	0.0
030	1.474	0.31	0.590	0.30	2.430	0.18	0.265	0.09	0.885	0.31	0.368	0.00	3.682	0.05	0.287	0.0
031	0.695	0.07	0.199	0.02	1.139	0.02	0.085	0.02	0.298	0.03	0.248	0.03	2.483	0.26	0.188	0.0
032	0.859	0.28	0.287	0.00	1.647	0.42	0.115	0.03	0.322	0.21	0.358	0.00	3.582	0.03	0.104	0.1
033	0.589	0.10	0.107	0.00	0.910	0.10	0.040	0.03	0.294	0.26	0.268	0.00	2.677	0.03	0.177	0.0
034	0.641	0.09	0.158	0.08	1.272	0.40	0.080	0.02	0.312	0.33	0.272	0.05	2.716	0.52	0.219	0.0
035	0.884	0.47	0.535	0.23	1.480	0.17	0.081	0.02	0.202	0.01	0.337	0.02	3.375	0.23	0.275	0.0
036	0.624	0.13	0.113	0.00	0.906	0.02	0.042	0.03	0.170	0.00	0.283	0.01	2.832	0.08	0.158	0.0
037	0.647	0.07	0.129	0.01	0.837	0.04	0.048	0.03	0.194	0.02	0.323	0.04	3.233	0.36	0.142	0.0
038	0.635	0.07	0.116	0.01	0.983	0.05	0.043	0.03	0.264	0.19	0.290	0.02	2.898	0.20	0.150	0.0
039	0.615	0.12	0.112	0.00	0.783	0.01	0.028	0.00	0.168	0.00	0.280	0.00	2.795	0.05	0.196	0.0
040	0.527	0.20	0.274	0.21	0.909	0.06	0.106	0.01	0.265	0.15	0.264	0.10	2.636	1.00	0.220	0.0
041	0.743	0.11	0.229	0.00	1.543	0.10	0.091	0.02	0.257	0.17	0.286	0.00	2.858	0.03	0.145	0.2
042	0.560	0.10	0.146	0.05	0.809	0.09	0.066	0.01	0.155	0.06	0.259	0.09	2.586	0.93	0.229	0.0
043	0.802	999.99	0.321	999.99	1.924	999.99	0.144	999.99	0.641	999.99	0.401	999.99	4.009	999.99	0.289	999.9
044	0.623	0.02	0.188	0.13	0.996	0.03	0.047	0.03	0.187	0.01	0.311	0.01	3.114	0.09	0.219	0.0
045	1.897	0.39	0.277	0.33	1.454	0.05	0.073	0.01	0.895	0.03	0.280	0.01	2.795	0.09	0.245	0.0
080	0.768	0.03	0.110	0.00	1.804	0.48	0.082	0.01	0.353	0.37	0.274	0.01	2.741	0.10	[illegible]	0.0
081	1.473	0.16	0.185	0.04	1.287	0.12	0.079	0.03	1.306	0.33	0.232	0.05	2.318	0.55	[illegible]	0.1
082	0.494	0.03	0.165	0.01	2.055	0.05	0.115	0.01	0.263	0.27	0.206	0.01	2.057	0.11	[illegible]	0.0
083	0.732	0.01	0.122	0.00	1.344	0.27	0.064	0.07	0.334	0.30	0.305	0.01	3.052	0.05	0.244	0.0
Ar.Mean	0.776	0.14	0.226	0.07	1.477	0.19	0.112	0.03	0.335	0.16	0.280	0.02	2.804	0.23	0.198	0.0
Std.Dev.	0.274	0.14	0.141	0.09	0.715	0.23	0.092	0.03	0.224	0.15	0.043	0.03	0.430	0.27	0.053	0.0

ARIZONA PUBLIC SERVICE
MONTHLY REPORT for 8-87

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

Location Number	PO4	d	CO3	d	HCO3	d	NH4	d	TSS	d	CU	d	Av d	SD(d)
001	0.012	0.00	2.943	0.52	7.064	1.25	0.300	0.17	12.866	19.32	0.059	0.01	1.59	5.11
002	0.016	0.01	2.636	0.09	6.327	0.22	0.422	0.01	23.682	4.45	0.053	0.00	0.38	1.17
003	0.015	0.01	2.523	0.02	6.055	0.05	0.152	0.10	24.186	13.91	0.076	0.05	1.04	3.70
004	0.010	0.00	2.466	0.02	5.918	0.05	0.148	0.10	10.823	11.74	0.124	0.15	0.89	3.12
005	0.010	0.00	2.466	0.16	4.136	3.18	0.099	0.01	8.320	11.87	0.049	0.00	1.13	3.20
006	0.011	0.00	2.659	0.18	4.457	3.41	0.106	0.01	14.559	12.68	0.081	0.06	1.21	3.42
007	0.022	0.02	2.379	0.72	5.710	1.74	0.150	0.14	56.317	80.36	0.048	0.01	6.02	21.40
008	0.012	0.00	2.932	0.36	7.036	0.87	0.117	0.01	15.795	0.79	0.059	0.01	0.19	0.30
009	0.028	0.03	3.585	0.28	8.605	0.68	0.287	0.02	20.361	15.93	0.072	0.01	1.27	4.22
010	0.023	0.02	2.841	0.23	6.818	0.55	0.291	0.36	11.318	1.36	0.057	0.00	0.26	0.37
011	0.011	0.00	2.864	0.07	6.873	0.16	0.115	0.00	12.682	14.05	0.057	0.00	1.03	3.75
012	0.072	0.05	3.011	0.02	10.855	7.31	0.181	0.12	45.191	11.18	0.060	0.00	1.41	3.41
013	0.023	0.02	3.148	0.89	7.555	2.13	0.342	0.40	13.850	3.90	0.063	0.02	0.64	1.11
014	0.127	0.05	2.534	0.07	12.164	0.33	0.101	0.00	15.286	12.57	0.051	0.00	1.08	3.32
015	0.011	0.00	2.648	0.11	6.355	0.27	0.106	0.00	8.327	11.47	0.053	0.00	0.92	3.04
016	0.013	0.01	1.716	0.25	6.027	3.22	0.306	0.02	12.473	4.33	0.034	0.01	0.60	1.36
017	0.012	0.00	3.125	0.20	7.500	0.49	0.125	0.01	7.966	9.89	0.062	0.00	0.79	2.62
018	0.011	0.00	2.739	0.02	6.573	0.05	0.110	0.00	6.568	2.14	0.055	0.00	0.24	0.58
019	0.027	0.02	2.614	0.82	8.086	5.59	0.165	0.15	27.459	5.54	0.052	0.02	0.99	1.96
020	0.008	0.00	2.114	0.05	6.327	2.40	0.210	0.25	9.736	2.75	0.106	0.13	0.44	0.91
021	0.012	0.00	2.987	0.03	7.169	0.06	0.239	0.00	13.769	13.26	0.060	0.00	1.02	3.53
022	0.012	0.00	2.897	0.10	6.952	0.25	0.230	0.22	6.026	6.16	0.058	0.00	0.54	1.62
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	0.045	999.99	2.795	999.99	6.709	999.99	0.112	999.99	74.918	999.99	0.056	999.99	999.99	999.99
025	0.060	0.01	2.989	0.30	10.582	6.11	0.176	0.10	58.082	38.38	0.060	0.01	3.30	10.22
026	0.013	0.00	3.129	0.00	7.510	0.00	0.188	0.13	14.082	21.91	0.094	0.06	1.61	5.84
027	0.008	0.00	2.102	0.07	5.045	0.16	0.338	0.18	15.868	12.94	0.042	0.00	1.01	3.43
028	0.010	0.00	2.500	0.00	6.000	0.00	0.100	0.00	19.500	21.00	0.050	0.00	1.61	5.59
030	0.096	0.16	3.682	0.05	8.836	0.11	1.106	0.46	40.595	31.43	0.074	0.00	2.39	8.36
031	0.015	0.01	2.483	0.26	5.959	0.62	0.444	0.05	21.372	22.03	0.050	0.01	1.67	5.86
032	0.014	0.00	3.582	0.03	8.597	0.06	0.143	0.00	27.155	37.06	0.072	0.00	2.73	9.88
033	0.011	0.00	2.677	0.03	6.424	0.06	0.321	0.00	15.564	16.21	0.054	0.00	1.20	4.32
034	0.011	0.00	2.716	0.52	4.435	2.92	0.109	0.02	19.784	25.29	0.054	0.01	2.17	6.70
035	0.013	0.00	3.375	0.23	8.100	0.56	0.200	0.12	17.783	14.71	0.067	0.00	1.20	3.89
036	0.011	0.00	2.832	0.08	4.841	4.10	0.113	0.00	14.260	15.11	0.085	0.05	1.40	4.09
037	0.013	0.00	3.233	0.36	5.369	3.91	0.129	0.01	16.914	17.44	0.065	0.01	1.59	4.68
038	0.012	0.00	2.898	0.20	6.955	0.49	0.116	0.01	12.123	18.25	0.058	0.00	1.40	4.85
039	0.011	0.00	2.795	0.05	6.709	0.11	0.112	0.00	15.736	20.38	0.140	0.17	1.50	5.44
040	0.017	0.02	2.636	1.00	6.327	2.40	0.105	0.04	45.782	53.96	0.053	0.02	4.23	14.33
041	0.017	0.01	2.858	0.03	6.859	0.06	0.171	0.11	17.679	16.99	0.057	0.00	1.28	4.52
042	0.010	0.00	2.586	0.93	6.207	2.23	0.103	0.04	19.686	24.10	0.073	0.02	2.05	6.38
043	0.032	999.99	4.009	999.99	9.621	999.99	0.160	999.99	11.224	999.99	0.080	999.99	999.99	999.99
044	0.019	0.01	3.114	0.09	7.473	0.22	0.251	0.26	13.852	21.39	0.062	0.00	1.60	5.70
045	0.011	0.00	2.795	0.09	6.709	0.22	0.167	0.11	16.368	19.54	0.056	0.00	1.49	5.19
080	0.011	0.00	2.741	0.10	6.579	0.25	0.163	0.10	2.741	0.10	0.055	0.00	0.12	0.15
081	0.013	0.01	2.318	0.55	5.564	1.31	0.226	0.04	4.132	4.17	0.046	0.01	0.53	1.11
082	0.008	0.00	2.057	0.11	7.336	4.53	0.329	0.02	3.959	3.92	0.041	0.00	0.65	1.52
083	0.012	0.00	3.052	0.05	7.324	0.12	0.244	0.00	8.284	10.52	0.061	0.00	0.82	2.79
Ar.Mean	0.021	0.01	2.804	0.23	6.950	1.44	0.211	0.09	19.255	16.37	0.064	0.02	1.36	4.40
Std.dev.	0.023	0.03	0.430	0.27	1.601	1.86	0.161	0.11	14.938	14.51	0.020	0.04	1.07	3.83

A R I Z O N A P U B L I C S E R V I C E
MONTHLY REPORT for 8-87

DEPOSITION DATA
Comments and Messages Only

Location Number	Sample A Comments	Sample B Comments	Processing Messages
001			
002			
003			
004			
005			
006			
007	SCREEN DESTROYED		
008			
009			
010			
011			
012			
013		SCREEN MISSING	
014			
015			
016	SCREEN MISSING		
017			
018			
019		SCREEN MISSING	
020			
021			
022			
023	VOID/NO ACCESS	VOID/NO ACCESS	MISSING SAMPLE A and
024	SCREEN MISSING	VOID/POSSIBLE CONTAMINATION	MISSING SAMPLE B
025			
026			
027			
028			
030	SAMPLE MOVED SLIGHTLY		
031			
032			
033			
034	SCREEN MISSING		
035			
036			
037			
038			
039			
040	SCREEN MISSING		
041			
042			
043	VOID/POSSIBLE CONTAMINATION		MISSING SAMPLE A
044			
045			
080			
081			
082			
083			

A R I Z O N A   P U B L I C   S E R V I C E
MONTHLY REPORT for 9-87

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	0.847	0.19	0.471	0.00	2.094	0.06	0.263	0.05	0.530	0.12	0.265	0.06	2.648	0.61	0.053	0.06
002	0.888	0.04	0.613	0.32	1.575	0.25	0.249	0.02	0.420	0.07	0.262	0.04	2.625	0.42	0.116	0.04
003	1.188	0.56	0.528	0.28	1.385	0.44	0.204	0.01	0.723	0.11	0.329	0.01	3.290	0.10	0.138	0.06
004	0.737	0.19	0.459	0.36	1.329	0.16	0.166	0.03	0.200	0.02	0.334	0.03	3.336	0.26	0.080	0.02
005	0.846	0.41	0.454	0.12	0.976	0.41	0.149	0.04	0.195	0.00	0.325	0.01	3.246	0.08	0.091	0.05
006	0.963	0.01	0.620	0.15	1.031	0.12	0.207	0.06	0.380	0.35	0.344	0.01	3.440	0.05	0.110	0.00
007	1.072	0.37	0.854	0.53	1.438	0.08	0.187	0.02	0.216	0.01	0.359	0.02	3.595	0.21	0.053	0.03
008	0.725	0.05	0.476	0.45	1.400	0.19	0.125	0.05	0.244	0.11	0.281	0.06	2.812	0.61	0.044	0.04
009	1.025	0.09	0.617	0.16	1.637	0.48	0.267	0.00	0.306	0.19	0.342	0.01	3.422	0.14	0.089	0.04
010	0.906	0.09	0.420	0.35	1.634	0.17	0.229	0.07	0.484	0.02	0.302	0.01	3.023	0.09	0.169	0.02
011	1.096	0.15	0.809	0.26	1.960	0.06	0.439	0.18	0.461	0.01	0.288	0.01	2.883	0.09	0.104	0.00
012	0.784	0.01	1.079	0.40	2.646	0.42	0.613	0.15	0.147	0.00	0.245	0.00	2.449	0.02	0.113	0.07
013	1.020	0.03	0.946	0.12	1.747	0.24	0.205	0.12	0.219	0.01	0.364	0.01	3.645	0.12	0.138	0.01
014	1.001	0.13	0.442	0.18	11.811	6.85	1.117	0.34	0.442	0.18	0.313	0.04	3.129	0.40	0.031	0.00
015	0.776	0.03	0.454	0.15	1.365	0.71	0.200	0.00	0.194	0.01	0.323	0.01	3.234	0.14	0.097	0.03
016	1.064	0.18	0.528	0.33	1.541	0.09	0.254	0.07	0.532	0.09	0.296	0.02	2.964	0.17	0.189	0.04
017	1.112	0.24	1.358	0.73	1.324	0.19	0.092	0.01	0.199	0.03	0.331	0.05	3.310	0.47	0.065	0.07
018	0.913	0.18	0.490	0.27	1.090	0.18	0.158	0.03	0.271	0.17	0.304	0.02	3.039	0.18	0.115	0.01
019	1.014	0.04	0.656	0.46	1.587	0.51	0.320	0.13	0.434	0.02	0.362	0.02	3.621	0.16	0.129	0.08
020	1.355	0.34	0.449	0.37	1.166	0.30	0.169	0.06	1.164	0.04	0.323	0.01	3.233	0.10	0.181	0.05
021	0.916	0.08	0.697	0.52	1.061	0.21	0.189	0.06	0.212	0.01	0.353	0.02	3.530	0.23	0.099	0.03
022	0.752	0.15	0.410	0.01	0.957	0.29	0.170	0.07	0.442	0.47	0.341	0.01	3.414	0.05	0.058	0.05
023	1.546	0.13	1.381	0.46	3.928	0.70	1.118	0.16	0.258	0.02	0.429	0.04	4.293	0.36	0.119	0.02
024	0.961	0.02	1.849	1.54	2.714	2.19	0.310	0.17	0.379	0.43	0.284	0.03	2.836	0.28	0.028	0.00
025	0.649	0.02	0.649	0.02	1.880	0.55	0.340	0.13	0.150	0.02	0.251	0.03	2.508	0.33	0.025	0.00
026	0.863	0.09	0.582	0.35	0.999	0.19	0.134	0.09	0.216	0.02	0.359	0.04	3.595	0.36	0.079	0.02
027	0.840	0.06	0.592	0.44	0.782	0.17	0.096	0.03	0.180	0.01	0.300	0.02	3.000	0.21	0.096	0.01
028	0.916	0.01	0.597	0.41	1.536	0.32	0.107	0.10	0.184	0.02	0.306	0.04	3.065	0.39	0.110	0.01
030	1.377	0.45	1.501	0.69	3.076	0.25	0.466	0.50	0.690	0.10	0.314	0.01	3.142	0.13	0.225	0.12
031	0.830	0.25	0.697	0.58	1.037	0.38	0.132	0.01	0.208	0.01	0.347	0.01	3.466	0.10	0.090	0.02
032	0.739	0.47	0.492	0.31	1.074	0.20	0.214	0.01	0.247	0.01	0.412	0.01	4.125	0.13	0.071	0.06
033	0.819	0.56	0.957	0.84	0.680	0.02	0.109	0.06	0.204	0.00	0.340	0.01	3.401	0.08	0.088	0.01
034	0.922	0.01	1.305	0.45	0.768	0.01	0.131	0.02	0.346	0.23	0.384	0.00	3.841	0.03	0.131	0.01
035	1.148	0.01	1.148	0.34	0.738	0.16	0.123	0.05	0.246	0.00	0.410	0.00	4.099	0.03	0.041	0.00
036	0.768	0.14	0.209	0.14	0.698	0.00	0.098	0.00	0.209	0.00	0.349	0.00	3.491	0.00	0.098	0.00
037	0.802	0.20	0.572	0.54	0.727	0.05	0.094	0.04	0.218	0.01	0.363	0.02	3.634	0.23	0.036	0.00
038	0.817	0.21	0.876	0.09	0.745	0.18	0.080	0.03	0.188	0.02	0.313	0.03	3.129	0.31	0.069	0.02
039	0.694	0.25	0.697	0.71	0.518	0.10	0.092	0.02	0.173	0.00	0.288	0.01	2.884	0.08	0.058	0.00
040	0.636	0.10	0.750	0.33	0.983	0.09	0.278	0.05	0.174	0.00	0.289	0.01	2.895	0.07	0.060	0.06
041	0.753	0.12	0.821	0.26	0.822	0.02	0.144	0.04	0.310	0.21	0.343	0.01	3.427	0.08	0.052	0.04
042	0.908	0.14	0.978	0.28	0.768	0.14	0.126	0.06	0.209	0.00	0.349	0.00	3.491	0.00	0.035	0.00
043	1.842	1.25	3.076	3.72	1.108	0.09	0.229	0.03	2.854	4.49	0.396	0.03	3.957	0.31	0.079	0.01
044	1.042	0.18	0.962	1.17	0.731	0.21	0.182	0.11	0.184	0.01	0.306	0.02	3.059	0.16	0.045	0.03
045	1.108	0.00	0.770	0.43	1.655	0.85	0.176	0.01	0.523	0.06	0.327	0.04	3.272	0.39	0.091	0.02
080	1.113	0.27	0.620	0.51	1.482	0.04	0.142	0.07	0.404	0.44	0.309	0.01	3.087	0.08	0.111	0.02
081	3.010	1.64	0.994	0.07	1.442	0.31	0.183	0.05	0.694	0.10	0.294	0.06	2.940	0.56	0.274	0.01
082	1.113	0.16	0.853	0.41	1.242	0.10	0.157	0.03	0.654	0.02	0.327	0.01	3.272	0.08	0.081	0.10
083	1.170	0.07	1.162	0.45	1.170	0.07	0.163	0.05	0.583	0.09	0.325	0.02	3.250	0.20	0.142	0.07
Ar.Mean	1.008	0.22	0.811	0.46	1.585	0.41	0.237	0.07	0.398	0.17	0.327	0.02	3.272	0.20	0.096	0.03
Std.Dev.	0.375	0.30	0.469	0.56	1.645	1.01	0.212	0.09	0.414	0.65	0.040	0.02	0.404	0.16	0.051	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 9-87

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

Location Number	PO4	d	CO3	d	HCO3	d	NH4	d	TSS	d	CU	d	Av d	SD(d)
001	0.031	0.01	2.648	0.61	9.637	5.10	0.106	0.02	11.428	7.86	0.053	0.01	1.06	2.37
002	0.026	0.01	2.625	0.42	4.315	2.96	0.105	0.02	11.695	7.51	0.052	0.01	0.87	2.06
003	0.013	0.00	3.290	0.10	5.560	4.44	0.132	0.00	5.560	4.44	0.066	0.00	0.75	1.57
004	0.013	0.00	3.336	0.26	5.581	4.23	0.133	0.01	11.421	4.88	0.067	0.01	0.75	1.62
005	0.013	0.00	3.246	0.08	3.246	0.08	0.130	0.00	8.447	1.50	0.065	0.00	0.20	0.40
006	0.014	0.00	3.440	0.05	3.440	0.05	0.138	0.00	13.066	1.18	0.069	0.00	0.15	0.31
007	0.014	0.00	3.595	0.21	6.184	5.38	0.144	0.01	7.435	7.47	0.072	0.00	1.02	2.33
008	0.011	0.00	2.812	0.61	4.568	2.90	0.112	0.02	20.766	6.62	0.056	0.01	0.84	1.83
009	0.014	0.00	3.422	0.14	8.212	0.34	0.137	0.01	14.245	11.73	0.068	0.00	0.95	3.10
010	0.012	0.00	3.023	0.09	7.256	0.23	0.121	0.00	15.089	3.16	0.060	0.00	0.31	0.83
011	0.041	0.04	2.883	0.09	6.919	0.22	0.115	0.00	28.866	5.55	0.058	0.00	0.48	1.46
012	0.069	0.04	2.449	0.02	12.736	0.12	0.098	0.00	54.375	1.50	0.049	0.00	0.20	0.40
013	0.029	0.03	3.645	0.12	8.747	0.28	0.217	0.14	29.850	3.41	0.073	0.00	0.33	0.89
014	0.259	0.09	3.129	0.40	39.572	9.92	0.125	0.02	19.866	2.46	0.192	0.15	1.51	3.04
015	0.013	0.00	3.234	0.14	5.548	4.77	0.129	0.01	9.661	3.46	0.065	0.00	0.68	1.49
016	0.024	0.00	2.964	0.17	7.113	0.41	0.180	0.13	10.094	1.76	0.059	0.00	0.25	0.45
017	0.013	0.00	3.310	0.47	3.310	0.47	0.132	0.02	19.769	0.14	0.066	0.01	0.21	0.23
018	0.012	0.00	3.039	0.18	3.039	0.18	0.122	0.01	10.278	3.03	0.061	0.00	0.32	0.79
019	0.022	0.02	3.621	0.16	6.209	5.33	0.145	0.01	21.140	13.93	0.072	0.00	1.49	3.84
020	0.013	0.00	3.233	0.10	3.233	0.10	0.129	0.00	6.189	6.02	0.065	0.00	0.54	1.58
021	0.014	0.00	3.530	0.23	3.530	0.23	0.141	0.01	3.530	0.23	0.071	0.00	0.13	[illegible]
022	0.142	0.26	3.414	0.05	5.785	4.69	0.475	0.68	3.414	0.05	0.068	0.00	0.49	[illegible]
023	0.112	0.03	4.293	0.36	12.928	16.91	0.172	0.01	98.416	7.13	0.086	0.01	1.88	4.71
024	0.032	0.06	2.836	0.28	4.920	4.45	2.495	4.77	23.564	14.78	0.084	0.05	2.08	4.00
025	0.054	0.02	2.508	0.33	4.148	2.95	0.100	0.01	44.953	15.09	0.050	0.01	1.39	4.02
026	0.014	0.00	3.595	0.36	3.595	0.36	0.144	0.01	5.302	3.05	0.072	0.01	0.35	0.79
027	0.012	0.00	3.000	0.21	3.000	0.21	0.120	0.01	3.000	0.21	0.060	0.00	0.11	0.13
028	0.012	0.00	3.065	0.39	7.355	0.93	0.123	0.02	5.346	4.95	0.061	0.01	0.54	1.30
030	0.273	0.32	3.142	0.13	5.387	4.62	0.562	0.35	35.783	2.30	0.063	0.00	0.71	1.26
031	0.014	0.00	3.466	0.10	5.855	4.68	0.139	0.00	9.683	2.48	0.069	0.00	0.62	1.34
032	0.016	0.00	4.125	0.13	4.125	0.13	0.165	0.01	27.947	12.32	0.082	0.00	0.98	3.27
033	0.014	0.00	3.401	0.08	3.401	0.08	0.136	0.00	3.401	0.08	0.068	0.00	0.13	0.25
034	0.015	0.00	3.841	0.03	3.841	0.03	0.154	0.00	15.372	6.25	0.077	0.00	0.50	1.66
035	0.016	0.00	4.099	0.03	4.099	0.03	0.164	0.00	15.584	5.02	0.082	0.00	0.40	1.33
036	0.014	0.00	3.491	0.00	3.491	0.00	0.140	0.00	8.728	10.47	0.070	0.00	0.77	2.79
037	0.015	0.00	3.634	0.23	3.634	0.23	0.145	0.01	16.221	15.56	0.073	0.00	1.22	4.13
038	0.013	0.00	3.129	0.31	3.129	0.31	0.125	0.01	8.762	0.87	0.063	0.01	0.17	0.24
039	0.012	0.00	2.884	0.08	2.884	0.08	0.115	0.00	5.514	5.34	0.058	0.00	0.48	1.41
040	0.023	0.02	2.895	0.07	2.895	0.07	0.116	0.00	24.900	1.76	0.058	0.00	0.19	0.46
041	0.014	0.00	3.427	0.08	8.224	0.19	0.137	0.00	11.219	15.51	0.069	0.00	1.18	4.12
042	0.056	0.08	3.491	0.00	5.935	4.89	0.419	0.56	10.823	14.66	0.070	0.00	1.49	4.00
043	1.773	3.36	3.957	0.31	20.188	22.13	4.011	7.11	12.538	5.34	0.079	0.01	3.44	5.88
044	0.012	0.00	3.059	0.16	3.059	0.16	0.122	0.01	12.881	19.48	0.061	0.00	1.55	5.17
045	0.013	0.00	3.272	0.39	5.426	3.92	0.131	0.02	12.088	11.87	0.065	0.01	1.29	3.21
080	0.012	0.00	3.087	0.08	5.275	4.45	0.123	0.00	8.630	2.26	0.062	0.00	0.59	[illegible]
081	0.012	0.00	2.940	0.56	4.802	3.17	0.118	0.02	9.295	0.57	0.059	0.01	0.51	[illegible]
082	0.013	0.00	3.272	0.08	5.534	4.45	0.131	0.00	8.899	11.33	0.065	0.00	1.20	[illegible]
083	0.013	0.00	3.250	0.20	5.455	4.21	0.130	0.01	7.130	0.86	0.065	0.00	0.45	1.11
Ar.Mean	0.071	0.09	3.272	0.20	6.382	2.83	0.285	0.29	16.295	5.99	0.069	0.01	0.79	1.96
Std.dev.	0.257	0.49	0.404	0.16	5.816	4.26	0.651	1.22	16.086	5.22	0.020	0.02	0.63	1.50

ARIZONA PUBLIC SERVICE
MONTHLY REPORT for 9-87

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			
02[illegible]			
0[illegible]			
022			
023			
024	SCREEN MISSING		
025			
026			
027			
028			
030			
031			
032			
033			
034			
035			
036			
037			
038			
039			
040			
041			
042	SCREEN MISSING	SCREEN MISSING	
043			
044			
045			
08[illegible]			
08[illegible]			
082			
083			

ARIZONA PUBLIC SERVICE
MONTHLY REPORT for 10-87

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	0.440	0.59	0.119	0.05	1.152	0.27	0.141	0.05	0.658	0.15	0.411	0.10	0.823	0.19	0.179	0.0
002	0.323	0.31	0.247	0.18	1.472	0.07	0.245	0.01	0.810	0.62	0.409	0.02	0.818	0.04	0.171	0.0
003	0.471	0.29	0.158	0.01	0.872	0.20	0.111	0.04	0.949	0.05	0.396	0.02	0.791	0.04	0.143	0.0
004	0.222	0.25	0.139	0.10	0.642	0.24	0.046	0.00	0.404	0.24	0.456	0.04	0.911	0.08	0.126	0.0
005	0.216	0.24	0.181	0.03	0.722	0.10	0.045	0.01	0.481	0.38	0.451	0.06	0.903	0.13	0.153	0.0
006	0.382	0.38	0.144	0.10	0.958	0.02	0.048	0.00	0.620	0.66	0.479	0.01	0.958	0.02	0.144	0.0
007	0.203	0.24	0.082	0.00	0.737	0.14	0.041	0.00	0.448	0.40	0.410	0.01	0.820	0.03	0.093	0.1
008	0.286	0.24	0.134	0.06	0.737	0.15	0.092	0.02	0.531	0.56	0.461	0.09	0.922	0.19	0.166	0.0
009	0.330	0.26	0.158	0.09	2.273	0.50	0.173	0.02	0.610	0.61	0.540	0.07	1.079	0.14	0.106	0.1
010	0.357	0.19	0.103	0.06	1.765	0.37	0.171	0.08	0.563	0.07	0.352	0.05	0.704	0.09	0.133	0.0
011	0.435	0.53	0.128	0.08	1.892	0.28	0.189	0.03	0.777	0.20	0.431	0.01	0.861	0.03	0.232	0.0
012	0.184	0.01	0.225	0.26	1.655	0.10	0.145	0.10	0.276	0.02	0.460	0.03	0.919	0.06	0.211	0.0
013	0.363	0.26	0.179	0.11	1.791	0.63	0.179	0.11	0.360	0.02	0.600	0.03	1.200	0.06	0.168	0.0
014	0.301	0.01	0.191	0.23	2.404	0.19	0.271	0.02	0.602	0.03	0.376	0.02	0.752	0.03	0.179	0.1
015	0.371	0.39	0.182	0.01	1.101	0.44	0.097	0.11	0.274	0.02	0.456	0.03	0.912	0.06	0.119	0.0
016	0.425	0.10	0.150	0.18	2.086	1.31	0.319	0.16	0.487	0.02	0.305	0.01	0.609	0.03	0.232	0.0
017	0.397	0.02	0.150	0.11	0.595	0.04	0.050	0.00	0.297	0.02	0.496	0.03	0.992	0.06	0.129	0.0
018	0.341	0.03	0.085	0.01	0.674	0.27	0.065	0.05	0.256	0.02	0.426	0.04	0.853	0.08	0.170	0.0
019	0.642	0.52	0.276	0.17	0.744	0.05	0.087	0.08	0.279	0.02	0.465	0.03	0.931	0.06	0.112	0.0
020	0.443	0.17	0.134	0.09	1.244	0.03	0.107	0.00	0.801	0.20	0.444	0.01	0.889	0.02	0.186	0.1
021	0.236	0.15	0.119	0.08	0.709	0.14	0.082	0.09	0.237	0.00	0.394	0.01	0.789	0.02	[illegible]	0.0
022	0.218	0.16	0.331	0.52	0.871	0.62	0.077	0.08	0.401	0.38	0.359	0.02	1.089	0.78	[illegible]	0.0
023	0.326	0.22	0.543	0.21	5.321	1.06	0.326	0.04	0.488	0.32	0.543	0.00	1.086	0.01	0.054	0.0
024	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	999.9
025	0.247	0.14	0.415	0.12	2.677	0.04	0.516	0.40	0.252	0.03	0.420	0.05	0.840	0.09	0.234	0.0
026	0.234	0.15	0.118	0.08	0.626	0.01	0.039	0.00	0.235	0.00	0.391	0.01	0.782	0.01	0.117	0.0
027	0.316	0.03	0.120	0.09	0.707	0.10	0.039	0.00	0.237	0.02	0.394	0.03	0.789	0.07	0.174	0.0
028	0.166	0.02	0.122	0.07	1.495	0.19	0.064	0.05	0.366	0.20	0.415	0.05	0.831	0.11	0.223	0.0
030	0.821	0.82	1.846	0.83	8.716	2.30	3.077	1.66	1.231	0.42	0.512	0.00	1.025	0.01	0.313	0.5
031	0.340	0.19	0.098	0.05	1.289	0.61	0.102	0.06	0.597	0.04	0.335	0.05	0.670	0.11	0.209	0.0
032	0.301	0.20	0.100	0.00	0.903	0.20	0.075	0.05	0.301	0.00	0.502	0.00	1.003	0.00	0.211	0.1
033	0.146	0.00	0.109	0.07	0.583	0.01	0.036	0.00	0.219	0.00	0.365	0.01	0.729	0.01	0.204	0.0
034	0.217	0.18	0.102	0.05	0.486	0.05	0.035	0.01	0.211	0.04	0.352	0.06	0.703	0.12	0.062	0.0
035	0.374	0.00	0.141	0.10	0.374	0.00	0.047	0.00	0.281	0.00	0.468	0.01	0.936	0.01	0.070	0.0
036	0.195	0.12	0.065	0.00	0.521	0.24	0.033	0.00	0.196	0.01	0.327	0.01	0.654	0.03	0.079	0.0
037	0.309	0.33	0.076	0.01	0.455	0.03	0.038	0.00	0.227	0.02	0.379	0.03	0.758	0.06	0.071	0.0
038	0.237	0.29	0.141	0.10	0.562	0.02	0.047	0.00	0.281	0.01	0.468	0.02	0.936	0.04	0.122	0.0
039	0.247	0.31	0.146	0.11	0.575	0.06	0.048	0.00	0.287	0.03	0.479	0.05	0.958	0.09	0.135	0.0
040	0.434	0.27	0.132	0.11	0.848	0.19	0.123	0.09	0.367	0.17	0.424	0.10	0.848	0.19	0.151	0.0
041	0.369	0.17	0.073	0.00	0.881	0.05	0.073	0.00	0.220	0.01	0.367	0.02	0.734	0.04	0.117	0.0
042	0.373	0.58	0.174	0.18	0.432	0.19	0.054	0.02	0.391	0.28	0.375	0.09	0.750	0.18	0.140	0.0
043	0.531	999.99	1.061	999.99	2.123	999.99	0.248	999.99	1.415	999.99	0.442	999.99	1.769	999.99	0.177	999.9
044	0.298	0.21	0.147	0.09	0.592	0.03	0.049	0.00	0.296	0.01	0.493	0.02	0.986	0.05	0.148	0.0
045	0.273	0.16	0.140	0.10	1.107	0.09	0.046	0.00	0.553	0.05	0.461	0.04	0.922	0.08	0.176	0.0
080	0.514	0.04	0.086	0.01	1.454	0.06	0.145	0.01	0.257	0.02	0.429	0.03	0.857	0.06	[illegible]	0.0
081	3.047	0.23	0.177	0.20	2.187	0.74	0.293	0.17	4.218	0.89	0.363	0.03	2.902	0.22	[illegible]	0.0
082	0.576	0.22	0.163	0.02	0.980	0.10	0.089	0.01	0.245	0.02	0.408	0.04	0.817	0.08	[illegible]	0.0
083	0.619	0.13	0.089	0.01	0.889	0.07	0.066	0.04	0.498	0.49	0.445	0.04	0.889	0.07	0.187	0.0
Ar.Mean	0.406	0.22	0.213	0.11	1.359	0.27	0.181	0.08	0.532	0.17	0.428	0.03	0.930	0.09	0.161	0.0
Std.Dev.	0.416	0.17	0.290	0.14	1.391	0.41	0.443	0.25	0.609	0.23	0.061	0.03	0.344	0.12	0.058	0.0

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	NH4	d	TSS	d	CU	d	Av d	SD(d)
001	0.016	0.00	4.113	0.97	6.653	4.11	0.421	0.26	4.113	0.97	0.082	0.02	0.55	1.08
002	0.049	0.00	4.089	0.19	6.883	5.40	0.491	0.02	4.089	0.19	0.082	0.00	0.51	1.42
003	0.016	0.00	3.955	0.20	6.654	5.20	0.235	0.15	5.883	3.66	0.079	0.00	0.71	1.61
004	0.018	0.00	4.556	0.39	4.556	0.39	0.182	0.02	4.556	0.39	0.091	0.01	0.16	0.15
005	0.018	0.00	4.514	0.64	4.514	0.64	0.181	0.03	11.544	3.76	0.090	0.01	0.43	0.98
006	0.019	0.00	4.792	0.08	4.792	0.08	0.192	0.00	4.792	0.08	0.096	0.00	0.11	0.19
007	0.016	0.00	4.099	0.13	4.099	0.13	0.164	0.01	19.676	0.62	0.082	0.00	0.13	0.18
008	0.018	0.00	4.609	0.94	8.165	8.06	0.286	0.24	4.609	0.94	0.092	0.02	0.83	2.11
009	0.022	0.00	5.395	0.68	12.948	1.63	0.216	0.03	10.957	10.45	0.108	0.01	1.04	2.74
010	0.014	0.00	3.520	0.46	8.448	1.10	0.291	0.32	3.520	0.46	0.070	0.01	0.23	0.30
011	0.017	0.00	4.306	0.15	10.335	0.35	0.432	0.19	8.117	7.48	0.086	0.00	0.67	1.97
012	0.046	0.02	4.597	0.29	11.032	0.70	0.552	0.03	8.603	7.72	0.092	0.01	0.67	2.04
013	0.024	0.00	6.000	0.29	10.098	7.91	0.240	0.01	13.989	16.27	0.120	0.01	1.84	4.65
014	0.060	0.00	3.762	0.17	9.029	0.41	0.301	0.01	7.524	0.34	0.075	0.00	0.11	0.14
015	0.018	0.00	4.560	0.31	4.560	0.31	0.277	0.20	4.560	0.31	0.091	0.01	0.16	0.16
016	0.037	0.03	3.047	0.14	7.312	0.34	0.428	0.14	9.127	0.80	0.061	0.00	0.23	0.37
017	0.020	0.00	4.958	0.31	8.536	7.46	0.198	0.01	13.761	7.08	0.099	0.01	1.08	2.62
018	0.017	0.00	4.264	0.42	4.264	0.42	0.171	0.02	9.183	10.26	0.085	0.01	0.83	2.72
019	0.038	0.04	4.653	0.31	11.167	0.73	0.378	0.40	7.056	5.11	0.093	0.01	0.54	1.33
020	0.018	0.00	4.444	0.11	4.444	0.11	0.178	0.00	6.694	4.61	0.089	0.00	0.39	1.22
021	0.016	0.00	3.944	0.08	6.678	5.39	0.158	0.00	3.944	0.08	0.079	0.00	0.44	1.43
022	0.103	0.18	3.595	0.21	8.628	0.50	0.214	0.13	3.595	0.21	0.072	0.00	0.27	0.25
023	0.043	0.00	5.431	0.03	20.617	15.10	0.217	0.00	5.431	0.03	0.109	0.00	1.22	4.01
024	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
025	0.066	0.03	4.198	0.46	18.285	4.69	0.247	0.14	25.703	8.90	0.084	0.01	1.08	2.56
026	0.016	0.00	3.912	0.06	3.912	0.06	0.156	0.00	5.851	3.81	0.078	0.00	0.30	1.01
027	0.016	0.00	3.944	0.33	3.944	0.33	0.158	0.01	8.467	9.38	0.079	0.01	0.75	2.49
028	0.017	0.00	4.153	0.53	9.967	1.27	0.166	0.02	6.875	4.92	0.083	0.01	0.53	1.31
030	0.205	0.12	5.125	0.03	25.661	26.79	0.409	0.41	210.222	72.89	0.102	0.00	7.63	20.05
031	0.013	0.00	3.349	0.54	8.038	1.30	0.134	0.02	3.349	0.54	0.067	0.01	0.26	0.37
032	0.020	0.00	5.017	0.00	8.529	7.02	0.201	0.00	5.017	0.00	0.100	0.00	0.54	1.87
033	0.015	0.00	3.647	0.05	8.752	0.12	0.292	0.00	3.647	0.05	0.073	0.00	0.03	0.04
034	0.014	0.00	3.517	0.62	3.517	0.62	0.141	0.02	3.517	0.62	0.070	0.01	0.18	0.25
035	0.019	0.00	4.681	0.05	4.681	0.05	0.187	0.00	10.733	12.05	0.094	0.00	0.88	3.22
036	0.013	0.00	3.272	0.13	3.272	0.13	0.131	0.01	3.272	0.13	0.065	0.00	0.06	0.08
037	0.015	0.00	3.789	0.28	3.789	0.28	0.152	0.01	3.789	0.28	0.076	0.01	0.10	0.13
038	0.019	0.00	4.681	0.19	4.681	0.19	0.187	0.01	4.681	0.19	0.094	0.00	0.08	0.10
039	0.019	0.00	4.792	0.47	4.792	0.47	0.192	0.02	4.792	0.47	0.141	0.08	0.16	0.19
040	0.017	0.00	4.240	0.96	7.542	7.56	0.170	0.04	8.378	7.32	0.085	0.02	1.22	2.65
041	0.015	0.00	3.672	0.21	6.171	4.79	0.147	0.01	7.071	7.00	0.073	0.00	0.88	2.17
042	0.048	0.06	3.750	0.88	6.067	3.76	0.481	0.63	3.750	0.88	0.075	0.02	0.55	0.97
043	0.371	999.99	4.422	999.99	22.997	999.99	0.177	999.99	4.422	999.99	0.088	999.99	999.99	999.99
044	0.020	0.00	4.929	0.23	12.496	15.36	0.197	0.01	9.469	9.31	0.099	0.00	1.81	4.61
045	0.018	0.00	4.611	0.39	4.611	0.39	0.184	0.02	4.611	0.39	0.092	0.01	0.13	0.15
080	0.017	0.00	4.286	0.32	10.286	0.77	0.171	0.01	11.111	0.88	0.086	0.01	0.16	0.29
081	0.029	0.00	3.627	0.27	11.714	6.67	0.365	0.17	16.819	8.49	0.073	0.01	1.29	2.70
082	0.016	0.00	4.085	0.40	6.804	5.04	0.163	0.02	27.616	3.80	0.082	0.01	0.70	1.60
083	0.018	0.00	4.446	0.37	4.446	0.37	0.178	0.01	7.428	5.59	0.089	0.01	0.52	1.47
Ar.Mean	0.036	0.01	4.284	0.33	8.284	3.36	0.242	0.08	12.253	5.21	0.087	0.01	0.72	1.82
Std.dev.	0.059	0.03	0.606	0.25	5.002	5.15	0.108	0.13	29.998	11.00	0.015	0.01	1.13	3.01

A R I Z O N A   P U B L I C   S E R V I C E
MONTHLY REPORT for 10-87

DEPOSITION DATA
Comments and Messages Only

Location Number	Sample A Comments	Sample B Comments	Processing Messages
001			
002	SCREEN MISSING	SCREEN MISSING	
003			
004			
005			
006			
007			
008			
009			
010	SCREEN MISSING	SCREEN MISSING	
011			
012			
013			
014			
015			
016			
017			
018			
019			
020			
021			
022			
023			
024	VOID/SAMPLER BLOWN OVER	VOID/SAMPLER BLOWN OVER	MISSING SAMPLE A and
025			
026			
027			
028			
030			
031			
032			
033			
034			
035			
036			
037			
038			
039			
040			
041			
042			
043		VOID\POSSIBLE CONTAMINATION	MISSING SAMPLE B
044			
045			
080			
081			
082			
083			

A R I Z O N A P U B L I C S E R V I C E
MONTHLY REPORT for 11-87

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	0.825	0.19	0.165	0.04	0.495	0.11	0.130	0.00	0.825	0.19	0.412	0.09	0.825	0.19	0.073	0.07
002	0.822	0.25	0.182	0.01	0.546	0.04	0.119	0.06	0.909	0.07	0.455	0.04	0.909	0.07	0.118	0.01
003	0.719	0.17	0.160	0.00	0.479	0.01	0.088	0.02	0.958	0.01	0.399	0.00	0.798	0.01	0.104	0.02
004	0.557	0.17	0.159	0.00	1.269	0.29	0.127	0.00	0.794	0.02	0.397	0.01	0.794	0.02	0.111	0.03
005	0.553	0.18	0.157	0.01	0.871	0.51	0.103	0.02	0.865	0.12	0.394	0.02	0.787	0.03	0.118	0.02
006	0.795	0.31	0.120	0.08	0.875	0.14	0.128	0.10	0.600	0.73	0.398	0.01	0.796	0.01	0.136	0.08
007	0.513	0.02	0.171	0.01	3.253	0.79	0.248	0.01	0.467	0.41	0.427	0.01	0.855	0.03	0.128	0.01
008	0.431	0.10	0.128	0.06	0.607	0.06	0.088	0.08	0.503	0.53	0.439	0.08	0.879	0.16	0.044	0.01
009	0.733	0.21	0.209	0.00	0.837	0.41	0.220	0.02	0.575	0.52	0.524	0.00	1.047	0.01	0.052	0.00
010	0.759	0.05	0.190	0.01	0.667	0.23	0.173	0.13	0.569	0.04	0.474	0.03	0.948	0.06	0.082	0.07
011	0.748	0.03	0.656	0.21	1.496	0.06	1.115	0.33	0.656	0.21	0.467	0.02	0.935	0.04	0.112	0.00
012	0.322	0.02	0.244	0.18	0.967	0.06	0.275	0.08	0.366	0.26	0.403	0.02	0.806	0.05	0.069	0.06
013	0.444	0.01	0.167	0.12	0.444	0.01	0.106	0.10	0.333	0.01	0.554	0.02	1.109	0.03	0.055	0.00
014	1.122	0.53	0.284	0.22	1.010	0.04	0.290	0.11	0.739	0.11	0.462	0.07	0.924	0.13	0.046	0.01
015	0.378	0.36	0.192	0.01	0.477	0.16	0.081	0.06	0.288	0.02	0.481	0.03	0.962	0.07	0.048	0.00
016	0.965	0.03	0.138	0.00	0.414	0.01	0.076	0.01	1.106	0.31	0.345	0.01	0.690	0.02	0.111	0.03
017	0.459	0.18	0.138	0.09	0.552	0.00	0.046	0.00	0.643	0.18	0.460	0.00	0.919	0.00	0.101	0.02
018	0.645	0.01	0.121	0.08	0.483	0.01	0.061	0.04	0.885	0.14	0.403	0.01	0.806	0.02	0.104	0.05
019	1.009	0.35	0.168	0.00	1.009	0.35	0.227	0.15	1.092	0.16	0.420	0.00	0.840	0.01	0.126	0.02
02[illegible]	4.424	0.05	0.268	0.01	1.610	0.08	0.202	0.04	5.023	0.42	0.335	0.02	4.025	0.20	0.233	0.14
0[illegible]	0.424	0.14	0.171	0.01	0.513	0.04	0.074	0.07	0.513	0.04	0.427	0.03	0.855	0.06	0.072	0.05
022	0.379	0.14	0.076	0.00	0.455	0.01	0.094	0.11	0.228	0.01	0.380	0.01	0.759	0.02	0.106	0.00
023	1.413	999.99	4.414	999.99	14.302	999.99	8.299	999.99	0.883	999.99	0.441	999.99	0.883	999.99	0.177	999.99
024	0.343	0.02	0.171	0.01	0.774	0.22	0.154	0.01	0.465	0.40	0.429	0.03	0.857	0.05	0.128	0.01
025	0.757	0.82	0.294	0.42	0.509	0.02	0.128	0.05	0.255	0.01	0.425	0.01	0.849	0.03	0.042	0.00
026	0.652	0.14	0.094	0.01	0.659	0.24	0.167	0.06	0.524	0.51	0.468	0.04	0.936	0.07	0.140	0.01
027	0.582	0.01	0.073	0.00	0.800	0.14	0.131	0.06	0.655	0.14	0.364	0.00	0.728	0.01	0.138	0.02
028	0.443	0.25	0.115	0.09	1.647	0.12	0.126	0.06	0.602	0.07	0.376	0.04	0.752	0.08	0.150	0.02
030	0.693	0.10	0.458	0.27	2.482	0.52	0.775	0.26	0.928	0.08	0.387	0.03	0.774	0.06	0.194	0.03
031	0.543	0.16	0.117	0.08	1.163	0.18	0.140	0.03	0.428	0.39	0.387	0.01	0.775	0.01	0.124	0.03
032	0.613	0.16	0.702	0.02	4.813	1.43	1.183	0.16	0.479	0.42	0.439	0.01	0.877	0.03	0.096	0.01
033	0.405	0.18	0.081	0.00	0.645	0.03	0.081	0.00	0.728	0.20	0.403	0.02	0.807	0.04	0.105	0.02
034	0.408	0.09	0.257	0.21	3.217	0.10	0.426	0.07	0.619	0.27	0.340	0.07	0.680	0.15	0.149	0.03
035	0.612	0.01	0.256	0.31	0.511	0.21	0.087	0.07	0.458	0.30	0.510	0.01	1.020	0.01	0.051	0.00
036	0.609	0.14	0.215	0.25	0.349	0.02	0.044	0.00	0.389	0.24	0.436	0.02	0.873	0.05	0.122	0.01
037	0.539	0.01	0.223	0.26	0.359	0.01	0.045	0.00	0.402	0.26	0.449	0.01	0.898	0.02	0.125	0.07
038	0.532	0.07	0.136	0.11	0.532	0.07	0.087	0.09	0.502	0.50	0.444	0.06	0.887	0.11	0.073	0.05
039	0.386	0.17	0.077	0.00	0.308	0.01	0.038	0.00	0.540	0.17	0.385	0.02	0.769	0.03	0.092	0.00
040	0.497	0.21	0.198	0.01	0.595	0.02	0.198	0.03	0.297	0.01	0.496	0.02	0.991	0.03	0.050	0.00
041	0.559	0.15	0.241	0.17	2.716	0.58	0.487	0.13	0.638	0.31	0.400	0.01	0.800	0.02	0.120	0.01
042	1.165	999.99	0.728	999.99	1.165	999.99	0.291	999.99	0.728	999.99	0.364	999.99	0.728	999.99	0.102	999.99
043	0.498	0.01	0.415	0.17	0.745	0.49	0.149	0.06	0.455	0.41	0.415	0.00	0.829	0.01	0.071	0.06
044	0.282	0.19	0.189	0.00	0.377	0.00	0.113	0.04	0.283	0.00	0.471	0.01	0.943	0.01	0.047	0.00
045	0.397	0.16	0.119	0.08	0.634	0.01	0.060	0.04	0.714	0.17	0.396	0.00	0.793	0.01	0.111	0.00
08[illegible]	1.470	0.09	0.218	0.13	1.916	0.42	0.250	0.05	1.612	0.19	0.367	0.02	0.735	0.05	0.154	0.00
08[illegible]	2.095	0.05	0.212	0.11	0.583	0.11	0.073	0.01	1.962	0.22	0.365	0.07	1.060	0.53	0.152	0.01
082	1.600	0.60	0.307	0.36	0.976	0.33	0.259	0.16	1.808	0.69	0.361	0.09	1.040	0.45	0.168	0.04
083	1.346	0.10	0.150	0.01	1.119	0.07	0.135	0.04	1.645	0.12	0.374	0.03	1.136	0.83	0.134	0.02
Ar.Mean	0.781	0.16	0.307	0.09	1.317	0.19	0.375	0.07	0.790	0.23	0.420	0.03	0.931	0.09	0.108	0.03
Std.Dev.	0.654	0.16	0.623	0.11	2.114	0.26	1.192	0.07	0.735	0.19	0.049	0.02	0.468	0.15	0.042	0.03

ARIZONA PUBLIC SERVICE
MONTHLY REPORT for 11-87

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

Location Number	PO4	d	CO3	d	HCO3	d	NH4	d	TSS	d	CU	d	Av d	SD(d)
001	0.024	0.01	4.125	0.94	7.341	7.37	0.165	0.04	11.906	5.44	0.082	0.02	1.05	2.31
002	0.027	0.02	4.547	0.36	7.856	6.98	0.182	0.01	10.912	0.87	0.091	0.01	0.63	1.84
003	0.016	0.00	3.992	0.05	6.803	5.67	0.160	0.00	15.987	6.58	0.080	0.00	0.90	2.22
004	0.016	0.00	3.971	0.09	9.529	0.21	0.159	0.00	7.584	7.31	0.079	0.00	0.58	1.94
005	0.016	0.00	3.937	0.15	6.748	5.78	0.157	0.01	14.206	3.71	0.079	0.00	0.75	1.74
006	0.016	0.00	3.982	0.07	6.792	5.69	0.240	0.16	11.175	6.56	0.080	0.00	1.00	2.19
007	0.017	0.00	4.273	0.14	15.464	10.75	0.258	0.18	26.395	11.12	0.085	0.00	1.68	3.93
008	0.018	0.00	4.393	0.80	7.749	7.52	0.176	0.03	22.361	6.36	0.088	0.02	1.13	2.48
009	0.021	0.00	5.237	0.03	8.893	7.29	0.209	0.00	25.136	0.13	0.105	0.00	0.62	1.93
010	0.019	0.00	4.741	0.32	11.379	0.77	0.190	0.01	16.023	4.60	0.095	0.01	0.45	1.21
011	0.047	0.02	4.674	0.19	11.218	0.45	0.187	0.01	79.479	5.06	0.093	0.00	0.47	1.33
012	0.033	0.03	4.031	0.24	9.675	0.58	0.161	0.01	28.146	3.15	0.081	0.00	0.34	0.82
013	0.022	0.00	5.545	0.16	9.482	8.04	0.222	0.01	30.021	11.96	0.111	0.00	1.46	3.70
014	0.044	0.05	4.621	0.67	11.089	1.61	0.185	0.03	28.446	1.39	0.092	0.01	0.36	0.53
015	0.019	0.00	4.808	0.35	8.296	7.32	0.192	0.01	21.155	1.53	0.096	0.01	0.71	1.95
016	0.014	0.00	3.448	0.12	5.819	4.62	0.138	0.00	8.952	1.06	0.069	0.00	0.45	1.23
017	0.018	0.00	4.596	0.02	11.031	0.05	0.184	0.00	7.821	6.47	0.092	0.00	0.50	1.72
018	0.016	0.00	4.029	0.09	9.669	0.21	0.161	0.00	4.029	0.09	0.081	0.00	0.05	0.06
019	0.034	0.03	4.200	0.04	10.080	0.10	0.168	0.00	18.463	6.53	0.084	0.00	0.55	1.72
020	0.020	0.01	3.354	0.17	12.862	10.02	0.334	0.12	20.125	1.00	0.067	0.00	0.88	[illegible]
021	0.017	0.00	4.273	0.32	10.255	0.76	0.171	0.01	8.545	0.64	0.085	0.01	0.16	[illegible]
022	0.031	0.03	3.795	0.09	9.109	0.22	0.380	0.16	10.920	14.16	0.076	0.00	1.07	3.77
023	0.124	999.99	4.414	999.99	44.143	999.99	0.177	999.99	582.686	999.99	0.088	999.99	999.99	999.99
024	0.044	0.05	4.286	0.27	10.286	0.64	0.171	0.01	16.420	9.59	0.086	0.01	0.81	2.53
025	0.017	0.00	4.246	0.13	10.189	0.32	0.170	0.01	22.050	2.70	0.085	0.00	0.32	0.72
026	0.019	0.00	4.682	0.36	7.832	5.94	0.187	0.01	13.109	1.02	0.094	0.01	0.60	1.56
027	0.015	0.00	3.640	0.04	8.735	0.11	0.218	0.14	13.871	13.27	0.073	0.00	1.00	3.53
028	0.015	0.00	3.761	0.41	13.783	10.49	0.222	0.13	17.970	1.05	0.075	0.01	0.92	2.77
030	0.084	0.04	3.868	0.32	14.117	10.44	0.612	0.26	64.787	3.88	0.077	0.01	1.16	2.85
031	0.015	0.00	3.875	0.07	9.300	0.16	0.233	0.16	17.818	1.24	0.077	0.00	0.18	0.32
032	0.097	0.02	4.386	0.14	27.100	11.44	0.440	0.19	136.636	23.82	0.088	0.00	2.70	6.78
033	0.016	0.00	4.034	0.20	9.682	0.49	0.244	0.17	6.000	3.73	0.081	0.00	0.36	0.98
034	0.041	0.01	3.398	0.75	17.064	5.11	0.347	0.21	37.450	9.61	0.068	0.01	1.19	2.76
035	0.020	0.00	5.102	0.07	12.245	0.16	0.204	0.00	15.286	5.92	0.102	0.00	0.51	1.56
036	0.017	0.00	4.364	0.23	4.364	0.23	0.175	0.01	7.339	5.72	0.087	0.00	0.49	1.51
037	0.018	0.00	4.489	0.11	7.670	6.48	0.180	0.00	8.580	8.30	0.090	0.00	1.11	2.68
038	0.018	0.00	4.436	0.56	7.736	7.16	0.177	0.02	13.586	10.54	0.089	0.01	1.38	3.24
039	0.015	0.00	3.846	0.15	6.591	5.64	0.154	0.01	6.591	5.64	0.077	0.00	0.85	2.03
040	0.020	0.00	4.955	0.16	8.368	6.66	0.198	0.01	21.739	7.22	0.099	0.00	1.03	2.51
041	0.032	0.03	4.000	0.09	19.991	1.15	0.241	0.17	15.264	11.55	0.080	0.00	1.03	3.04
042	0.029	999.99	3.640	999.99	8.735	999.99	0.582	999.99	3.640	999.99	0.073	999.99	999.99	999.99
043	0.058	0.02	4.147	0.04	7.065	5.88	0.830	0.34	14.894	13.11	0.083	0.00	1.47	3.69
044	0.019	0.00	4.714	0.05	8.033	6.69	0.189	0.00	13.200	0.15	0.094	0.00	0.51	1.78
045	0.016	0.00	3.964	0.04	9.514	0.10	0.159	0.00	7.513	7.05	0.079	0.00	0.55	1.87
080	0.022	0.01	3.675	0.24	14.130	11.19	0.441	0.03	21.291	0.10	0.073	0.00	0.89	[illegible]
081	0.015	0.00	3.647	0.67	8.752	1.61	0.146	0.03	13.655	1.82	0.073	0.01	0.37	[illegible]
082	0.014	0.00	3.615	0.90	8.675	2.15	0.271	0.22	29.096	10.06	0.072	0.02	1.15	2.62
083	0.015	0.00	3.739	0.28	8.974	0.67	0.299	0.02	15.510	9.30	0.075	0.01	0.82	2.45
Ar.Mean	0.027	0.01	4.198	0.25	10.838	4.19	0.243	0.06	32.579	5.92	0.084	0.01	0.81	2.15
Std.dev.	0.022	0.01	0.488	0.24	6.231	3.82	0.136	0.09	83.981	4.89	0.010	0.00	0.47	1.20

ARIZONA PUBLIC SERVICE
MONTHLY REPORT for 11-87

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			
021			
022			
023	LIQUID DIRTY	VOID/MONITOR TIPPED OVER	MISSING SAMPLE B
024			
025			
026			
027			
028			
030		FEATHERS ON SCREEN	
031			
032	LIQUID DIRTY	LIQUID DIRTY	
033			
034	SCREEN MISSING	SCREEN MISSING	
035			
036			
037			
038			
039			
040			
041			
042	VOID/HOLE IN JAR	PIECES OF JAR IN SAMPLE	MISSING SAMPLE A
043	BIRD DROPPINGS ON SCREEN		
044			
045			
080			
081			
082			
083			

A R I Z O N A   P U B L I C   S E R V I C E
MONTHLY REPORT for 12-87

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	0.983	0.32	0.208	0.13	0.977	0.24	0.182	0.04	0.625	0.39	0.700	0.03	1.400	0.06	0.104	0.07
002	1.490	0.87	0.201	0.13	0.808	0.03	0.472	0.10	0.940	0.23	0.673	0.03	1.347	0.06	0.129	0.13
003	1.784	0.32	0.486	0.32	1.135	0.32	0.227	0.06	1.297	0.00	0.811	0.00	1.621	0.00	0.162	0.00
004	1.326	0.44	0.293	0.03	0.878	0.10	0.122	0.09	1.171	0.13	0.732	0.08	1.464	0.16	0.073	0.07
005	1.184	0.01	0.222	0.15	1.037	0.31	0.074	0.00	0.816	0.75	0.740	0.01	1.480	0.01	0.111	0.01
006	0.607	0.01	0.228	0.15	0.454	0.30	0.076	0.00	0.455	0.01	0.758	0.01	1.516	0.02	0.076	0.00
007	0.666	0.24	0.134	0.01	0.534	0.02	0.067	0.00	0.401	0.02	0.668	0.03	1.336	0.05	0.067	0.00
008	0.587	0.21	0.175	0.11	0.471	0.02	0.089	0.06	0.354	0.02	0.589	0.03	1.179	0.05	0.059	0.00
009	0.609	0.22	0.244	0.01	0.857	0.27	0.294	0.16	0.366	0.01	0.611	0.02	1.221	0.04	0.061	0.00
010	0.937	0.31	0.267	0.01	1.067	0.05	0.213	0.01	0.400	0.02	0.667	0.03	1.334	0.06	0.067	0.00
011	0.704	0.01	0.235	0.00	1.173	0.02	0.329	0.05	0.352	0.01	0.587	0.01	1.173	0.02	0.059	0.00
012	0.734	0.06	0.372	0.28	1.224	0.10	0.724	0.13	0.367	0.03	0.612	0.05	1.224	0.10	0.061	0.01
013	0.642	0.27	0.128	0.00	0.512	0.01	0.108	0.09	0.384	0.01	0.640	0.02	1.280	0.03	0.064	0.00
014	1.032	0.02	0.194	0.13	1.032	0.02	0.233	0.11	0.706	0.63	0.645	0.02	1.291	0.03	0.096	0.06
015	1.032	1.10	0.286	0.33	0.467	0.03	0.058	0.00	0.350	0.02	0.584	0.04	1.168	0.07	0.058	0.00
016	2.400	0.60	0.450	0.30	1.050	0.30	0.510	0.06	1.650	0.30	0.750	0.00	1.500	0.00	0.225	0.03
017	0.757	0.03	0.126	0.01	0.504	0.02	0.063	0.00	0.880	0.21	0.631	0.03	1.261	0.06	0.119	0.11
018	1.103	0.25	0.368	0.25	0.490	0.00	0.061	0.00	1.348	0.25	0.612	0.00	1.225	0.01	0.159	0.02
019	1.329	0.31	0.241	0.01	0.482	0.03	0.101	0.08	1.323	0.17	0.603	0.03	1.206	0.07	0.144	0.04
020	9.263	0.11	0.488	0.02	0.976	0.04	0.105	0.09	11.338	0.22	0.610	0.02	8.511	2.09	[illegible]	0.05
021	0.492	0.01	0.185	0.13	0.617	0.26	0.173	0.05	0.369	0.01	0.615	0.01	1.231	0.03	[illegible]	0.00
022	0.352	0.21	0.119	0.01	0.601	0.29	0.091	0.07	0.715	0.06	0.596	0.05	1.192	0.11	[illegible]	0.05
023	1.500	999.99	1.250	999.99	6.750	999.99	1.475	999.99	1.500	999.99	0.625	999.99	1.250	999.99	0.062	999.99
024	0.584	0.25	0.466	0.01	1.276	0.66	0.186	0.04	0.646	0.60	0.583	0.02	1.165	0.04	0.100	0.08
025	0.584	0.26	0.232	0.01	0.930	0.04	0.420	0.11	0.349	0.02	0.581	0.03	1.162	0.05	0.058	0.00
026	0.491	0.01	0.185	0.13	0.491	0.01	0.061	0.00	0.554	0.38	0.614	0.01	1.228	0.02	0.061	0.00
027	0.752	0.30	0.225	0.15	0.601	0.00	0.075	0.00	0.451	0.00	0.752	0.00	1.503	0.01	0.113	0.07
028	0.748	0.00	0.187	0.13	0.998	0.00	0.106	0.09	0.374	0.00	0.624	0.00	1.247	0.01	0.150	0.05
030	1.507	0.03	0.880	0.27	4.267	0.43	1.193	0.15	1.129	0.23	0.628	0.01	1.256	0.02	0.145	0.17
031	1.032	0.30	0.173	0.13	0.913	0.07	0.122	0.13	1.032	0.30	0.571	0.04	1.142	0.08	0.205	0.01
032	0.844	0.16	0.243	0.02	0.844	0.16	0.217	0.31	0.728	0.07	0.607	0.06	1.214	0.12	0.121	0.01
033	0.616	0.24	0.186	0.13	0.618	0.26	0.062	0.00	0.370	0.01	0.617	0.01	1.233	0.02	0.136	0.03
034	0.789	0.52	0.132	0.00	0.527	0.00	0.066	0.00	0.395	0.00	0.658	0.01	1.317	0.01	0.066	0.00
035	0.552	0.02	0.138	0.01	0.552	0.02	0.069	0.00	0.414	0.02	0.690	0.03	1.381	0.06	0.069	0.00
036	0.718	0.47	0.120	0.00	0.359	0.23	0.060	0.00	0.360	0.01	0.600	0.01	1.200	0.02	0.090	0.06
037	0.492	0.02	0.183	0.11	0.366	0.23	0.062	0.00	0.369	0.02	0.615	0.03	1.231	0.06	0.062	0.00
038	0.581	0.24	0.174	0.11	0.464	0.00	0.058	0.00	0.348	0.00	0.581	0.01	1.161	0.01	0.058	0.00
039	0.517	0.01	0.258	0.00	0.517	0.01	0.065	0.00	0.387	0.01	0.646	0.01	1.292	0.02	0.065	0.00
040	0.592	0.28	0.235	0.02	0.592	0.28	0.247	0.04	0.353	0.02	0.588	0.04	1.176	0.08	0.059	0.00
041	0.520	0.00	0.324	0.39	0.780	0.01	0.065	0.00	0.584	0.38	0.650	0.01	1.300	0.01	0.065	0.00
042	0.479	0.06	0.184	0.14	0.479	0.06	0.060	0.01	0.359	0.05	0.599	0.08	1.197	0.16	0.060	0.01
043	1.178	999.99	0.471	999.99	1.178	999.99	0.353	999.99	1.649	999.99	0.589	999.99	1.178	999.99	0.165	999.99
044	0.604	0.21	0.121	0.01	0.485	0.02	0.061	0.00	0.364	0.02	0.607	0.03	1.213	0.06	0.061	0.00
045	0.814	0.22	0.174	0.11	0.466	0.01	0.058	0.00	0.349	0.01	0.582	0.01	1.164	0.02	0.122	0.13
080	1.949	0.12	0.565	0.66	0.919	0.05	0.138	0.01	1.490	0.15	0.574	0.03	1.148	0.06	[illegible]	0.01
081	6.108	1.10	0.863	1.17	1.135	0.05	0.240	0.08	6.230	0.88	0.709	0.03	1.418	0.06	[illegible]	0.04
082	4.379	1.08	0.508	0.54	0.998	0.08	0.092	0.06	3.991	0.30	0.624	0.05	3.047	3.51	0.274	0.02
083	5.495	0.05	0.478	0.00	0.956	0.01	0.179	0.07	5.256	0.05	0.597	0.01	2.995	3.61	0.334	0.04
Ar.Mean	1.342	0.26	0.304	0.15	0.954	0.12	0.212	0.05	1.180	0.15	0.636	0.02	1.500	0.24	0.121	0.03
Std.Dev.	1.658	0.29	0.222	0.21	1.029	0.15	0.277	0.06	1.911	0.22	0.057	0.02	1.098	0.78	0.091	0.04

ARIZONA PUBLIC SERVICE
MONTHLY REPORT for 12-87

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

Location Number	PO4	d	CO3	d	HCO3	d	NH4	d	TSS	d	CU	d	Av d	SD(d)
001	0.028	0.00	7.000	0.31	7.000	0.31	0.280	0.01	7.000	0.31	0.140	0.01	0.16	0.15
002	0.027	0.00	6.734	0.28	6.734	0.28	0.269	0.01	28.369	9.26	0.135	0.01	0.82	2.44
003	0.032	0.00	8.107	0.00	8.107	0.00	0.324	0.00	12.161	8.11	0.162	0.00	0.65	2.15
004	0.085	0.11	7.321	0.82	7.321	0.82	0.846	1.07	7.321	0.82	0.146	0.02	0.33	0.38
005	0.030	0.00	7.402	0.07	20.726	0.18	0.296	0.00	15.580	16.42	0.148	0.00	1.28	4.36
006	0.030	0.00	7.582	0.10	14.361	13.46	0.303	0.00	11.397	7.73	0.152	0.00	1.56	3.99
007	0.027	0.00	6.681	0.25	6.681	0.25	0.267	0.01	6.681	0.25	0.134	0.01	0.08	0.11
008	0.024	0.00	5.893	0.27	5.893	0.27	0.236	0.01	5.893	0.27	0.118	0.01	0.09	0.11
009	0.024	0.00	6.107	0.21	6.107	0.21	0.244	0.01	29.357	5.91	0.122	0.00	0.51	1.56
010	0.040	0.03	6.672	0.28	6.672	0.28	0.267	0.01	26.800	11.80	0.133	0.01	0.92	3.13
011	0.035	0.02	5.866	0.11	5.866	0.11	0.235	0.00	48.048	10.85	0.117	0.00	0.80	2.89
012	0.048	0.04	6.121	0.51	6.121	0.51	0.245	0.02	83.443	16.71	0.122	0.01	1.33	4.43
013	0.026	0.00	6.402	0.16	6.402	0.16	0.256	0.01	12.236	11.83	0.128	0.00	0.90	3.15
014	0.039	0.02	6.453	0.16	6.453	0.16	0.258	0.01	6.453	0.16	0.129	0.00	0.11	0.16
015	0.023	0.00	5.839	0.37	5.839	0.37	0.234	0.01	9.796	7.54	0.117	0.01	0.71	1.99
016	0.030	0.00	7.500	0.00	7.500	0.00	0.300	0.00	36.000	24.00	0.150	0.00	1.83	6.38
017	0.025	0.00	6.306	0.28	6.306	0.28	0.252	0.01	10.622	8.36	0.126	0.01	0.67	2.21
018	0.086	0.07	6.125	0.03	6.125	0.03	0.491	0.49	6.125	0.03	0.122	0.00	0.10	0.15
019	0.024	0.00	6.028	0.33	6.028	0.33	0.241	0.01	9.125	6.53	0.121	0.01	0.57	1.72
020	0.024	0.00	6.097	0.25	6.097	0.25	0.244	0.01	6.097	0.25	0.122	0.00	0.24	0.54
0[illegible]	0.025	0.00	6.153	0.14	6.153	0.14	0.246	0.01	9.194	5.94	0.123	0.00	0.48	1.57
02[illegible]	0.035	0.02	5.958	0.53	5.958	0.53	0.466	0.43	11.558	11.73	0.119	0.01	1.01	3.09
023	0.025	999.99	6.250	999.99	47.500	999.99	0.250	999.99	122.500	999.99	0.125	999.99	999.99	999.99
024	0.210	0.05	5.826	0.19	15.129	1.84	1.639	0.98	5.826	0.19	0.117	0.00	0.35	0.52
025	0.035	0.02	5.812	0.27	5.812	0.27	0.232	0.01	32.657	10.80	0.116	0.01	0.85	2.87
026	0.025	0.00	6.139	0.11	6.139	0.11	0.246	0.00	10.475	8.78	0.123	0.00	0.68	2.33
027	0.045	0.03	7.516	0.03	7.516	0.03	0.301	0.00	19.552	9.10	0.150	0.00	0.70	2.42
028	0.025	0.00	6.236	0.03	11.861	11.28	0.249	0.00	9.347	6.19	0.125	0.00	1.27	3.32
030	0.114	0.13	6.278	0.11	32.644	0.58	0.378	0.26	85.400	6.53	0.126	0.00	0.64	1.71
031	0.023	0.00	5.708	0.42	11.033	11.07	0.228	0.02	26.383	8.77	0.114	0.01	1.53	3.59
032	0.024	0.00	6.069	0.58	11.269	9.82	0.243	0.02	30.289	0.49	0.121	0.01	0.85	2.59
033	0.025	0.00	6.167	0.11	6.167	0.11	0.247	0.00	14.256	16.29	0.123	0.00	1.23	4.34
034	0.026	0.00	6.583	0.06	11.172	9.12	0.263	0.00	6.583	0.06	0.132	0.00	0.70	2.43
035	0.028	0.00	6.903	0.31	6.903	0.31	0.276	0.01	10.431	7.36	0.138	0.01	0.58	1.95
036	0.024	0.00	6.000	0.11	6.000	0.11	0.240	0.00	9.028	6.17	0.120	0.00	0.51	1.63
037	0.025	0.00	6.153	0.31	6.153	0.31	0.246	0.01	9.153	5.69	0.123	0.01	0.49	1.50
038	0.023	0.00	5.806	0.06	5.806	0.06	0.232	0.00	5.806	0.06	0.116	0.00	0.04	0.07
039	0.026	0.00	6.458	0.08	6.458	0.08	0.258	0.00	6.458	0.08	0.129	0.00	0.02	0.03
040	0.024	0.00	5.879	0.40	5.879	0.40	0.235	0.02	31.709	0.18	0.118	0.01	0.13	0.15
041	0.091	0.13	6.500	0.06	18.200	0.16	0.648	0.77	9.764	6.58	0.130	0.00	0.61	1.73
042	0.024	0.00	5.986	0.81	5.986	0.81	0.239	0.03	5.986	0.81	0.120	0.02	0.22	0.32
043	0.071	999.99	5.889	999.99	16.489	999.99	0.707	999.99	11.778	999.99	0.118	999.99	999.99	999.99
044	0.024	0.00	6.067	0.29	6.067	0.29	0.243	0.01	9.027	5.62	0.121	0.01	0.47	1.49
045	0.023	0.00	5.819	0.08	5.819	0.08	0.233	0.00	11.094	10.63	0.116	0.00	0.81	2.83
080	0.023	0.00	5.741	0.31	5.741	0.31	0.230	0.01	5.741	0.31	0.115	0.01	0.15	0.19
0[illegible]	0.028	0.00	7.092	0.29	7.092	0.29	0.284	0.01	20.289	26.10	0.142	0.01	2.15	6.91
082	0.025	0.00	6.236	0.47	6.236	0.47	0.249	0.02	14.036	15.13	0.125	0.01	1.55	4.01
083	0.131	0.21	5.973	0.05	5.973	0.05	0.239	0.00	10.173	8.45	0.119	0.00	0.90	2.37
Ar.Mean	0.040	0.02	6.363	0.24	9.281	1.45	0.326	0.10	19.437	7.07	0.127	0.00	0.71	2.13
Std.dev.	0.035	0.04	0.572	0.19	7.544	3.40	0.232	0.25	22.929	6.34	0.011	0.00	0.50	1.64

Location Number	Sample A Comments	Sample B Comments	Processing Messages
001			
002			
003			
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013			
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015			
016			
017			
018		BIRD DROPPINGS ON SCREEN	
019			
020			
021			
022			
023	LIQUID DIRTY	VOID/MONITOR KNOCKED OVER	MISSING SAMPLE B
024			
025			
026			
027			
028			
030	BIRD DROPPINGS ON SCREEN		
031			
032			
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039			
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042			
043	VOID/CONTAMINATION		MISSING SAMPLE A
044			
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083			

APPENDIX D

SUSPENDED PARTICULATE MATTER DATA

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."

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

Suspended Particulate

12/04/87

Monitoring Location		008	009	010	020	021	027
Year		87	87	87	87	87	87
Month		1	1	1	1	1	1
Lab Number		87-03-184	87-03-184	87-03-184	87-03-184	87-03-184	87-03-184
Calcium	(ug/m3)	1.41	1.80	1.92	1.58	1.38	1.66
Chloride	(ug/m3)	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3
Iron	(ug/m3)	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002
Fluoride	(ug/m3)	0.059	0.059	0.059	0.073	0.062	0.062
Potassium	(ug/m3)	-0.30	-0.30	-0.30	-0.30	-0.30	-0.30
Magnesium	(ug/m3)	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02
Sodium	(ug/m3)	0.70	0.65	0.65	0.90	0.62	0.65
Nitrate	(ug/m3)	0.20	0.23	0.22	0.48	0.20	0.25
Sulfate	(ug/m3)	1.4	1.4	1.4	1.7	1.4	1.4
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

12/04/87

Monitoring Location		008	009	010	020	021	027
Year		87	87	87	87	87	87
Month		2	2	2	2	2	2
Lab Number		87-04-013	87-04-013	87-04-013	87-04-013	87-04-013	87-04-013
Calcium	(ug/m3)	0.85	1.93	1.37	1.20	0.90	1.20
Chloride	(ug/m3)	-0.3	-0.3	-0.3	0.6	-0.3	-0.3
Iron	(ug/m3)	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002
Fluoride	(ug/m3)	0.006	0.009	0.009	0.023	0.006	0.009
Potassium	(ug/m3)	-0.30	-0.30	-0.30	-0.30	-0.30	-0.30
Magnesium	(ug/m3)	0.06	0.09	0.12	0.09	0.06	0.09
Sodium	(ug/m3)	0.47	0.55	0.55	1.02	0.41	0.55
Nitrate	(ug/m3)	0.18	0.23	0.26	0.29	0.29	0.26
Sulfate	(ug/m3)	1.2	1.5	1.5	1.8	1.2	1.5
Phosphate	(ug/m3)	-0.02	-0.02	0.06	-0.02	-0.02	-0.02

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Suspended Particulate

12/04/87

Monitoring Location		008	009	010	020	021	027
Year		87	87	87	87	87	87
Month		3	3	3	3	3	3
Lab Number		87-05-008	87-05-008	87-05-008	87-05-008	87-05-008	87-05-008
Calcium	(ug/m3)	0.98	1.68	1.07	1.15	1.07	1.12
Chloride	(ug/m3)	-0.3	-0.3	-0.3	0.5	-0.3	-0.3
Iron	(ug/m3)	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002
Fluoride	(ug/m3)	0.007	0.012	0.009	0.016	0.009	0.014
Potassium	(ug/m3)	-0.30	-0.30	-0.30	-0.30	-0.30	-0.30
Magnesium	(ug/m3)	0.05	0.07	0.07	0.07	0.07	0.07
Sodium	(ug/m3)	0.65	0.65	0.65	1.00	0.65	0.70
Nitrate	(ug/m3)	0.19	0.21	0.19	0.21	0.19	0.21
Sulfate	(ug/m3)	1.4	1.4	1.4	1.9	1.4	1.4
Phosphate	(ug/m3)	0.02	0.05	0.07	0.02	0.05	0.05

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

Suspended Particulate

12/04/87

Monitoring Location		008	009	010	021	027	029
Year		87	87	87	87	87	87
Month		4	4	4	4	4	4
Lab Number		87-06-057	87-06-057	87-06-057	87-06-057	87-06-057	87-06-057
Calcium	(ug/m3)	1.73	2.40	1.67	2.23	2.55	2.08
Chloride	(ug/m3)	0.3	0.3	0.3	0.3	0.3	0.6
Iron	(ug/m3)	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002
Fluoride	(ug/m3)	0.018	0.021	0.021	0.018	0.023	0.026
Potassium	(ug/m3)	-0.30	-0.30	-0.30	-0.30	-0.30	-0.30
Magnesium	(ug/m3)	0.09	0.12	0.18	0.09	0.12	0.09
Sodium	(ug/m3)	0.62	0.62	0.64	0.62	0.68	0.88
Nitrate	(ug/m3)	0.21	0.32	0.29	0.26	0.26	0.26
Sulfate	(ug/m3)	1.8	1.8	2.1	1.8	1.8	2.1
Phosphate	(ug/m3)	-0.02	0.06	0.06	0.09	0.09	0.03

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

Suspended Particulate

12/04/87

Monitoring Location		008	009	010	020	021	027
Year		87	87	87	87	87	87
Month		5	5	5	5	5	5
Lab Number		87-06-469	87-06-469	87-06-469	87-06-469	87-06-469	87-06-469
Calcium	(ug/m3)	1.40	1.96	2.34	1.34	1.49	2.34
Chloride	(ug/m3)	0.9	0.9	0.9	0.9	0.9	0.9
Iron	(ug/m3)	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002
Fluoride	(ug/m3)	0.015	0.015	0.018	0.018	0.009	0.020
Potassium	(ug/m3)	-0.30	-0.30	-0.30	-0.30	-0.30	-0.30
Magnesium	(ug/m3)	0.12	0.18	0.26	0.12	0.12	0.12
Sodium	(ug/m3)	0.76	0.76	0.76	0.91	0.73	0.79
Nitrate	(ug/m3)	0.23	0.29	0.32	0.26	0.26	0.29
Sulfate	(ug/m3)	2.3	2.3	2.3	2.6	2.3	2.6
Phosphate	(ug/m3)	-0.02	-0.02	0.09	-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

12/04/87

Monitoring Location		008	009	010	020	021	027
Year		87	87	87	87	87	87
Month		6	6	6	6	6	6
Lab Number		87-08-097	87-08-097	87-08-097	87-08-097	87-08-097	87-08-097
Calcium	(ug/m3)	1.45	2.16	2.55	1.75	2.13	2.64
Chloride	(ug/m3)	0.5	0.5	1.4	0.9	0.9	0.7
Iron	(ug/m3)	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002
Fluoride	(ug/m3)	0.012	0.014	0.021	0.019	0.021	0.026
Potassium	(ug/m3)	0.33	0.33	0.35	0.30	0.35	0.33
Magnesium	(ug/m3)	0.07	0.12	0.21	0.09	0.09	0.14
Sodium	(ug/m3)	0.80	0.80	0.84	1.03	1.12	0.91
Nitrate	(ug/m3)	0.05	0.23	0.28	0.19	0.28	0.30
Sulfate	(ug/m3)	1.6	1.6	1.6	1.6	1.9	1.6
Phosphate	(ug/m3)	0.05	0.07	0.12	0.02	0.07	0.02

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

Suspended Particulate

12/04/87

Monitoring Location		008	009	010	020	021	027
Year		87	87	87	87	87	87
Month		7	7	7	7	7	7
Lab Number		87-09-131	87-09-131	87-09-131	87-09-131	87-09-131	87-09-131
Calcium	(ug/m3)	1.69	2.54	2.48	2.33	2.09	3.06
Chloride	(ug/m3)	0.3	0.6	0.6	1.2	0.3	0.6
Iron	(ug/m3)	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002
Fluoride	(ug/m3)	0.012	0.012	0.015	0.021	0.012	0.030
Potassium	(ug/m3)	-0.30	-0.30	-0.30	-0.30	-0.30	-0.30
Magnesium	(ug/m3)	-0.02	0.03	0.06	0.03	-0.02	0.06
Sodium	(ug/m3)	0.63	0.73	0.85	1.63	0.70	0.72
Nitrate	(ug/m3)	0.15	0.21	0.21	0.24	0.18	0.27
Sulfate	(ug/m3)	1.2	1.2	1.5	2.1	1.2	1.2
Phosphate	(ug/m3)	0.06	-0.02	0.09	0.06	0.06	0.03

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

Suspended Particulate

12/04/87

Monitoring Location		008	009	010	020	021	027
Year		87	87	87	87	87	87
Month		8	8	8	8	8	8
Lab Number		87-10-185	87-10-185	87-10-185	87-10-185	87-10-185	87-10-185
Calcium	(ug/m3)	1.61	1.58	1.61	1.20	0.59	1.09
Chloride	(ug/m3)	-0.3	-0.3	-0.3	0.3	-0.3	0.3
Iron	(ug/m3)	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002
Fluoride	(ug/m3)	0.015	0.012	0.012	0.015	0.012	0.015
Potassium	(ug/m3)	-0.30	-0.30	-0.30	-0.30	-0.30	-0.30
Magnesium	(ug/m3)	0.03	0.03	0.06	0.03	-0.02	0.03
Sodium	(ug/m3)	0.70	0.73	0.73	0.97	0.56	0.85
Nitrate	(ug/m3)	0.23	0.21	0.23	0.26	0.15	0.26
Sulfate	(ug/m3)	2.6	2.3	2.3	2.6	1.5	2.3
Phosphate	(ug/m3)	0.06	0.09	0.09	0.03	0.03	0.06

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

Suspended Particulate

12/04/87

Monitoring Location		008	009	010	020	021	027
Year		87	87	87	87	87	87
Month		9	9	9	9	9	9
Lab Number		87-10-474	87-10-474	87-10-474	87-10-474	87-10-474	87-10-474
Calcium	(ug/m3)	1.38	3.46	2.56	2.22	2.57	2.12
Chloride	(ug/m3)	-0.3	0.5	-0.3	0.9	-0.3	-0.3
Iron	(ug/m3)	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002
Fluoride	(ug/m3)	0.012	0.021	0.016	0.019	0.016	0.016
Potassium	(ug/m3)	-0.30	-0.30	-0.30	-0.30	-0.30	-0.30
Magnesium	(ug/m3)	0.05	0.12	0.11	0.09	0.07	0.09
Sodium	(ug/m3)	0.56	0.85	0.59	1.19	0.63	0.65
Nitrate	(ug/m3)	0.16	0.35	0.23	0.26	0.28	0.21
Sulfate	(ug/m3)	2.1	2.6	2.3	3.0	2.1	2.6
Phosphate	(ug/m3)	-0.02	0.05	0.05	-0.02	0.05	-0.02

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

Suspended Particulate

02/22/88

Monitoring Location	008	009	010	020	021	027
Year	87	87	87	87	87	87
Month	10	10	10	10	10	10
Lab Number	87-12-322	87-12-322	87-12-322	87-12-322	87-12-322	87-12-322
Calcium (ug/m3)	0.35	0.59	0.47	0.55	0.62	1.18
Chloride (ug/m3)	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3
Iron (ug/m3)	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002
Fluoride (ug/m3)	0.009	0.018	0.012	0.020	0.009	0.035
Potassium (ug/m3)	-0.30	-0.30	-0.30	-0.30	-0.30	-0.30
Magnesium (ug/m3)	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02
Sodium (ug/m3)	0.44	0.41	0.47	1.25	0.47	0.94
Nitrate (ug/m3)	0.18	0.23	0.20	0.31	0.21	0.71
Sulfate (ug/m3)	1.8	1.8	1.6	2.7	1.8	3.5
Phosphate (ug/m3)	-0.02	-0.02	-0.02	-0.02	0.03	-0.02

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

Suspended Particulate

02/22/88

Monitoring Location		008	009	010	020	021	027
Year		87	87	87	87	87	87
Month		11	11	11	11	11	11
Lab Number		87-12-323	87-12-323	87-12-323	87-12-323	87-12-323	87-12-323
Calcium	(ug/m3)	0.33	1.62	0.34	0.77	0.47	1.11
Chloride	(ug/m3)	1.2	1.5	1.0	1.2	1.3	1.2
Iron	(ug/m3)	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002
Fluoride	(ug/m3)	0.012	0.015	0.010	0.015	0.013	0.015
Potassium	(ug/m3)	-0.30	-0.30	-0.30	-0.30	-0.30	-0.30
Magnesium	(ug/m3)	-0.02	0.06	-0.02	-0.02	-0.02	0.03
Sodium	(ug/m3)	0.57	0.51	0.61	0.72	0.54	0.53
Nitrate	(ug/m3)	0.18	0.24	0.20	0.24	0.19	

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

Suspended Particulate

02/22/88

Monitoring Location		008	009	010	020	021	027
Year		87	87	87	87	87	87
Month		12	12	12	12	12	12
Lab Number		88-02-092	88-02-092	88-02-092	88-02-092	88-02-092	88-02-092
Calcium	(ug/m3)	1.17	1.75	1.22	0.84	1.05	1.24
Chloride	(ug/m3)	0.6	-0.3	-0.3	-0.3	-0.3	0.5
Iron	(ug/m3)	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002
Fluoride	(ug/m3)	0.015	0.012	0.009	0.007	0.012	0.017
Potassium	(ug/m3)	-0.30	-0.30	-0.30	-0.30	-0.30	-0.30
Magnesium	(ug/m3)	0.06	0.07	0.05	0.02	0.05	0.05
Sodium	(ug/m3)	0.58	0.44	0.44	0.44	0.47	0.50
Nitrate	(ug/m3)	0.29	0.33	0.28	0.23	0.30	0.33
Sulfate	(ug/m3)	1.8	1.2	0.7	1.6	0.9	1.4
Phosphate	(ug/m3)	-0.02	0.05	-0.02	-0.02	-0.02	0.07

APPENDIX E

INDIGENOUS VEGETATION DATA

Appendix E

Indigenous Vegetation Data

Indigenous vegetation data were collected during the first and fourth quarters of 1987 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 1987. No data were reported as missing during the 1987 data collection.

ARIZONA PUBLIC SERVICE

Indigenous Vegetation

Phytomass

12/03/87 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	1	2	3	4	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	87	87	87	87	87	87	87	87	87	87
NUS Sample ID Number	1001	1002	1003	1004	1005	1006	1007	1008	1009	1010
Laboratory Number	1	2	3	4	5	6	7	8	9	10
Cations (ppm)										
Sodium	541.00	486.00	568.00	541.00	595.00	514.00	405.00	432.00	405.00	432.00
Potassium	11905.00	8077.00	7308.00	10952.00	11429.00	9615.00	7308.00	8846.00	10476.00	8846.00
Calcium	17100.00	20000.00	19175.00	17288.00	13763.00	21100.00	16850.00	16850.00	12488.00	16163.00
Magnesium	1525.00	1475.00	863.00	1113.00	1125.00	1463.00	1613.00	1525.00	1275.00	1250.00
Anions (ppm)										
Chloride	7200.00	9400.00	9000.00	7200.00	7600.00	7600.00	9000.00	9000.00	5600.00	9800.00
Sulfate	1389.00	1667.00	1944.00	2344.00	1962.00	1962.00	2240.00	2044.00	1962.00	2865.00
Nitrate	21.00	24.00	30.00	18.00	26.00	21.00	18.00	29.00	24.00	16.00
Phosphate	1309.00	1163.00	945.00	1163.00	1381.00	1163.00	1236.00	800.00	945.00	1091.00
Fluoride	20.00	20.00	19.00	16.00	16.00	17.00	15.00	19.00	15.00	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

12/03/87 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	87	87	87	87	87	87	87	87	87	87
NUS Sample ID Number	1011	1012	1013	1014	1015	1016	1017	1018	1019	1020
Laboratory Number	11	12	13	14	15	16	17	18	19	20
Cations (ppm)										
Sodium	71154.00	77273.00	75000.00	86364.00	79545.00	57692.00	86364.00	69231.00	75000.00	73077.00
Potassium	23333.00	28889.00	25000.00	18095.00	17143.00	33750.00	22222.00	21667.00	17143.00	21111.00
Calcium	17625.00	17038.00	9988.00	11013.00	16375.00	17013.00	23713.00	19900.00	14688.00	13588.00
Magnesium	6625.00	6500.00	4138.00	4538.00	7625.00	6625.00	12875.00	7125.00	4375.00	7375.00
Anions (ppm)										
Chloride	65400.00	53600.00	54800.00	74000.00	64200.00	55600.00	75400.00	49600.00	55600.00	47400.00
Sulfate	6719.00	5781.00	5469.00	8281.00	7969.00	7031.00	6094.00	4861.00	5313.00	4583.00
Nitrate	98.00	148.00	89.00	78.00	68.00	88.00	101.00	64.00	84.00	68.00
Phosphate	1454.00	1163.00	1672.00	1527.00	1309.00	1091.00	873.00	1454.00	1672.00	1527.00
Fluoride	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00

ARIZONA PUBLIC SERVICE

Indigenous Vegetation

Phytomass

12/03/87 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	87	87	87	87	87	87	87	87	87	87
NUS Sample ID Number	1021	1022	1023	1024	1025	1026	1027	1028	1029	1030
Laboratory Number	21	22	23	24	25	26	27	28	29	30
Cations (ppm)										
Sodium	79545.00	79545.00	77273.00	79545.00	86364.00	95455.00	84091.00	67308.00	69231.00	67308.00
Potassium	16500.00	27895.00	27895.00	39286.00	20526.00	14500.00	13500.00	30714.00	25263.00	16000.00
Calcium	23938.00	12625.00	13213.00	16538.00	13638.00	15600.00	14775.00	23900.00	16463.00	12900.00
Magnesium	9750.00	5875.00	6875.00	7375.00	8000.00	11625.00	8625.00	9500.00	8750.00	9000.00
Anions (ppm)										
Chloride	49000.00	70800.00	85400.00	75000.00	74800.00	70600.00	55200.00	58200.00	52200.00	56600.00
Sulfate	4875.00	4625.00	6000.00	4875.00	4375.00	4875.00	5200.00	4875.00	7200.00	5200.00
Nitrate	113.00	106.00	86.00	138.00	140.00	161.00	139.00	135.00	151.00	169.00
Phosphate	727.00	1091.00	1236.00	1091.00	1091.00	945.00	1091.00	945.00	1018.00	1236.00
Fluoride	13.00	13.00	11.00	10.00	12.00	12.00	12.00	11.00	11.00	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

12/03/87 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	W	W	W	W	W	W	W	W	E	E
Quarter	1	1	1	1	1	1	1	1	1	1
Month	3	3	3	3	3	3	3	3	3	3
Year	87	87	87	87	87	87	87	87	87	87
NUS Sample ID Number	1031	1032	1033	1034	1035	1036	1037	1038	1039	1040
Laboratory Number	31	32	33	34	35	36	37	38	39	40
Cations (ppm)										
Sodium	405.00	622.00	514.00	459.00	405.00	514.00	811.00	486.00	757.00	459.00
Potassium	17000.00	15500.00	14000.00	8929.00	14000.00	13500.00	15500.00	15500.00	14500.00	10500.00
Calcium	15000.00	14463.00	10325.00	11487.00	16050.00	15287.00	17338.00	17450.00	11975.00	17188.00
Magnesium	1300.00	1763.00	1250.00	1475.00	1413.00	1663.00	1713.00	1650.00	1113.00	1650.00
Anions (ppm)										
Chloride	12000.00	8800.00	7600.00	7800.00	6800.00	10000.00	10800.00	12200.00	8800.00	6800.00
Sulfate	4725.00	3375.00	5925.00	3857.00	5857.00	4571.00	5525.00	3857.00	3661.00	2482.00
Nitrate	50.00	44.00	50.00	36.00	43.00	61.00	68.00	48.00	61.00	59.00
Phosphate	1236.00	1309.00	1018.00	945.00	1163.00	945.00	1091.00	1091.00	1163.00	945.00
Fluoride	15.00	19.00	13.00	16.00	15.00	13.00	14.00	14.00	14.00	17.00

ARIZONA PUBLIC SERVICE

Indigenous Vegetation

Phytomass

12/03/87 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	87	87	87	87	87	87	87	87	87	87
NUS Sample ID Number	1041	1042	1043	1044	1045	1046	1047	1048	1049	1050
Laboratory Number	41	42	43	44	45	46	47	48	49	50
Cations (ppm)										
Sodium	676.00	649.00	514.00	568.00	568.00	486.00	730.00	541.00	486.00	432.00
Potassium	5926.00	9630.00	9259.00	12381.00	12857.00	12381.00	13333.00	10000.00	10952.00	12857.00
Calcium	17450.00	15800.00	13763.00	17525.00	13938.00	14525.00	13938.00	20288.00	13675.00	13738.00
Magnesium	1625.00	1738.00	2113.00	1150.00	1263.00	1300.00	1500.00	1863.00	1138.00	1188.00
Anions (ppm)										
Chloride	8000.00	7200.00	8200.00	8400.00	7600.00	8000.00	8600.00	7000.00	6400.00	7400.00
Sulfate	4405.00	5024.00	4429.00	4528.00	4405.00	4024.00	4405.00	4786.00	4429.00	4690.00
Nitrate	19.00	20.00	23.00	30.00	28.00	14.00	24.00	30.00	25.00	20.00
Phosphate	1309.00	1163.00	1454.00	1454.00	1600.00	1527.00	1381.00	1309.00	1309.00	1309.00
Fluoride	19.00	19.00	19.00	18.00	19.00	18.00	17.00	18.00	22.00	21.00

ARIZONA PUBLIC SERVICE

Indigenous Vegetation

Phytomass

12/03/87 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	1	2	3	4	5	6	7	8	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	87	87	87	87	87	87	87	87	87	87
NUS Sample ID Number	1051	1052	1053	1054	1055	1056	1057	1058	1059	1060
Laboratory Number	51	52	53	54	55	56	57	58	59	60
Cations (ppm)										
Sodium	649.00	514.00	676.00	676.00	541.00	541.00	486.00	405.00	649.00	514.00
Potassium	12381.00	10952.00	11905.00	13810.00	13333.00	15741.00	13810.00	17143.00	13333.00	14762.00
Calcium	11550.00	10725.00	11925.00	14988.00	11100.00	11513.00	14575.00	14813.00	12913.00	11138.00
Magnesium	1013.00	1100.00	1163.00	2125.00	1075.00	1213.00	1663.00	988.00	1225.00	1363.00
Anions (ppm)										
Chloride	8400.00	6400.00	7400.00	7200.00	8000.00	6400.00	8000.00	7200.00	6800.00	6200.00
Sulfate	2877.00	2917.00	3234.00	2583.00	6405.00	4524.00	4357.00	2877.00	2222.00	2861.00
Nitrate	33.00	48.00	39.00	38.00	30.00	43.00	29.00	39.00	48.00	44.00
Phosphate	1454.00	1454.00	1309.00	1454.00	1381.00	1236.00	1381.00	1309.00	1236.00	1381.00
Fluoride	21.00	20.00	19.00	19.00	18.00	17.00	19.00	20.00	20.00	18.00

ARIZONA PUBLIC SERVICE

Indigenous Vegetation

Phytomass

12/03/87 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	87	87	87	87	87	87	87	87	87	87
NUS Sample ID Number	1061	1062	1063	1064	1065	1066	1067	1068	1069	1070
Laboratory Number	61	62	63	64	65	66	67	68	69	70
Cations (ppm)										
Sodium	417.00	389.00	306.00	333.00	306.00	333.00	333.00	417.00	361.00	528.00
Potassium	12000.00	10000.00	8846.00	6923.00	6538.00	12000.00	12000.00	8462.00	16500.00	14000.00
Calcium	17825.00	17263.00	18175.00	19900.00	17575.00	17438.00	12863.00	14238.00	13412.00	15638.00
Magnesium	1800.00	1288.00	1400.00	1450.00	1388.00	1250.00	1313.00	1400.00	938.00	1125.00
Anions (ppm)										
Chloride	7440.00	6600.00	5400.00	6000.00	7000.00	9600.00	7000.00	8000.00	6600.00	7000.00
Sulfate	4375.00	3438.00	3750.00	4375.00	5313.00	6250.00	5000.00	5313.00	5625.00	3438.00
Nitrate	33.00	29.00	25.00	23.00	24.00	28.00	25.00	24.00	28.00	29.00
Phosphate	2036.00	1745.00	1527.00	1454.00	1491.00	1963.00	1745.00	1600.00	1600.00	1600.00
Fluoride	17.00	18.00	17.00	15.00	16.00	15.00	16.00	15.00	17.00	15.00

ARIZONA PUBLIC SERVICE

Indigenous Vegetation

Phytomass

12/03/87 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	87	87	87	87	87	87	87	87	87	87
NUS Sample ID Number	1071	1072	1073	1074	1075	1076	1077	1078	1079	1080
Laboratory Number	71	72	73	74	75	76	77	78	79	80
Cations (ppm)										
Sodium	47368.00	42105.00	61538.00	50000.00	61538.00	71154.00	47368.00	51923.00	53846.00	43421.00
Potassium	23500.00	23500.00	16500.00	19500.00	29500.00	27000.00	27000.00	21500.00	20000.00	21000.00
Calcium	10138.00	12150.00	10163.00	10525.00	9950.00	8450.00	11263.00	12525.00	13313.00	10688.00
Magnesium	7875.00	6750.00	6500.00	9500.00	3663.00	7250.00	8375.00	9625.00	9125.00	9250.00
Anions (ppm)										
Chloride	41200.00	41240.00	46000.00	42800.00	52400.00	45800.00	40200.00	43800.00	44800.00	33400.00
Sulfate	6875.00	12105.00	6250.00	9063.00	10000.00	8125.00	8438.00	11053.00	12105.00	8750.00
Nitrate	135.00	95.00	126.00	114.00	110.00	129.00	103.00	88.00	99.00	113.00
Phosphate	1381.00	1818.00	2036.00	1745.00	1818.00	1527.00	1563.00	1745.00	1818.00	1381.00
Fluoride	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00

ARIZONA PUBLIC SERVICE

Indigenous Vegetation

Phytomass

12/03/87 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	1	2	3	4	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	87	87	87	87	87	87	87	87	87	87
NUS Sample ID Number	1081	1082	1083	1084	1085	1086	1087	1088	1089	1090
Laboratory Number	810	811	812	813	814	815	816	817	818	819
Cations (ppm)										
Sodium	686.00	543.00	629.00	629.00	571.00	514.00	400.00	371.00	400.00	371.00
Potassium	9600.00	8000.00	8800.00	9200.00	8000.00	7600.00	11000.00	9200.00	8400.00	7600.00
Calcium	13950.00	21225.00	18775.00	12612.00	14650.00	20950.00	17750.00	14700.00	14113.00	17475.00
Magnesium	1475.00	1688.00	1188.00	1337.00	1650.00	2050.00	2175.00	1950.00	1825.00	1850.00
Anions (ppm)										
Chloride	5440.00	6000.00	6080.00	6800.00	6800.00	8920.00	10600.00	6920.00	8600.00	6400.00
Sulfate	3125.00	2833.00	3333.00	2375.00	3333.00	2250.00	3083.00	2813.00	3646.00	3333.00
Nitrate	48.00	53.00	54.00	70.00	51.00	39.00	78.00	24.00	44.00	39.00
Phosphate	960.00	1029.00	754.00	1029.00	960.00	754.00	754.00	892.00	754.00	686.00
Fluoride	21.00	23.00	20.00	19.00	19.00	20.00	21.00	20.00	22.00	17.00

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

Indigenous Vegetation

Phytomass

12/03/87 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	87	87	87	87	87	87	87	87	87	87
NUS Sample ID Number	1091	1092	1093	1094	1095	1096	1097	1098	1099	1100
Laboratory Number	850	851	852	853	854	855	856	857	858	859
Cations (ppm)										
Sodium	51786.00	40000.00	50000.00	42500.00	45000.00	47500.00	48750.00	45000.00	55357.00	40000.00
Potassium	16087.00	19565.00	15652.00	13478.00	12609.00	18261.00	14348.00	16957.00	13478.00	14783.00
Calcium	12700.00	10225.00	9688.00	12125.00	13725.00	10675.00	14137.00	10875.00	11350.00	13362.00
Magnesium	6250.00	4763.00	4037.00	4287.00	5750.00	3425.00	7875.00	4725.00	3688.00	6250.00
Anions (ppm)										
Chloride	59200.00	47200.00	43600.00	46880.00	36400.00	52200.00	48120.00	46120.00	65600.00	46600.00
Sulfate	8125.00	5313.00	6250.00	9688.00	8438.00	5625.00	7188.00	3889.00	5625.00	5625.00
Nitrate	181.00	211.00	204.00	155.00	171.00	119.00	94.00	67.00	82.00	110.00
Phosphate	892.00	892.00	892.00	1166.00	1029.00	1029.00	892.00	1303.00	1235.00	1235.00
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

12/03/87 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	87	87	87	87	87	87	87	87	87	87
NUS Sample ID Number	1101	1102	1103	1104	1105	1106	1107	1108	1109	1110
Laboratory Number	860	861	862	863	864	865	866	867	868	869
Cations (ppm)										
Sodium	42500.00	43750.00	48750.00	58929.00	57143.00	48750.00	55357.00	46250.00	51786.00	41250.00
Potassium	16087.00	18261.00	13478.00	25000.00	16957.00	15217.00	18696.00	19130.00	16957.00	12609.00
Calcium	14637.00	10962.00	13000.00	16887.00	14237.00	13575.00	10662.00	12288.00	12525.00	10275.00
Magnesium	7750.00	4525.00	6375.00	6250.00	6750.00	9625.00	4313.00	4612.00	7375.00	7250.00
Anions (ppm)										
Chloride	38680.00	38200.00	59200.00	55400.00	53200.00	43800.00	75000.00	36400.00	44800.00	33680.00
Sulfate	3333.00	5000.00	8750.00	5313.00	4444.00	3611.00	6250.00	2000.00	5625.00	4444.00
Nitrate	93.00	69.00	60.00	124.00	60.00	89.00	101.00	149.00	125.00	363.00
Phosphate	617.00	960.00	1029.00	1097.00	686.00	1166.00	823.00	960.00	1029.00	1166.00
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

12/03/87 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	W	W	W	W	W	W	W	W	E	E
Quarter	4	4	4	4	4	4	4	4	4	4
Month	10	10	10	10	10	10	10	10	10	10
Year	87	87	87	87	87	87	87	87	87	87
NUS Sample ID Number	1111	1112	1113	1114	1115	1116	1117	1118	1119	1120
Laboratory Number	820	821	822	823	824	825	826	827	828	829
Cations (ppm)										
Sodium	429.00	543.00	514.00	543.00	571.00	486.00	571.00	486.00	571.00	543.00
Potassium	13000.00	12000.00	15500.00	9200.00	12000.00	11000.00	12000.00	11500.00	12500.00	11000.00
Calcium	14875.00	11775.00	12537.00	12837.00	13850.00	12375.00	13400.00	14587.00	1175.00	14387.00
Magnesium	1887.00	1850.00	1738.00	2313.00	1925.00	1712.00	1600.00	1712.00	1675.00	1825.00
Anions (ppm)										
Chloride	8480.00	5800.00	6480.00	6120.00	6400.00	7200.00	6400.00	9000.00	8400.00	8400.00
Sulfate	2938.00	4479.00	6750.00	6354.00	8860.00	3417.00	2875.00	6458.00	3500.00	4000.00
Nitrate	41.00	46.00	53.00	53.00	19.00	48.00	40.00	29.00	36.00	39.00
Phosphate	617.00	892.00	892.00	960.00	892.00	754.00	754.00	892.00	892.00	892.00
Fluoride	19.00	21.00	19.00	16.00	20.00	16.00	19.00	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

12/03/87 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	87	87	87	87	87	87	87	87	87	87
NUS Sample ID Number	1121	1122	1123	1124	1125	1126	1127	1128	1129	1130
Laboratory Number	830	831	832	833	834	835	836	837	838	839
Cations (ppm)										
Sodium	455.00	424.00	394.00	364.00	394.00	455.00	455.00	364.00	455.00	333.00
Potassium	7826.00	7826.00	8261.00	9565.00	9130.00	7826.00	11000.00	8261.00	10500.00	10500.00
Calcium	20862.00	14950.00	18013.00	15837.00	14375.00	20475.00	13875.00	20137.00	14225.00	13762.00
Magnesium	2013.00	1775.00	2675.00	1400.00	1462.00	1837.00	1337.00	2050.00	1362.00	1600.00
Anions (ppm)										
Chloride	7600.00	7440.00	8000.00	5840.00	6400.00	6400.00	6880.00	7040.00	10000.00	6400.00
Sulfate	3750.00	2417.00	2583.00	2583.00	3250.00	2167.00	3167.00	2667.00	2917.00	2250.00
Nitrate	28.00	31.00	28.00	38.00	43.00	33.00	40.00	21.00	71.00	57.00
Phosphate	892.00	1029.00	926.00	892.00	1029.00	1097.00	960.00	1029.00	1029.00	1029.00
Fluoride	16.00	17.00	15.00	15.00	15.00	16.00	16.00	15.00	16.00	14.00

ARIZONA PUBLIC SERVICE

Indigenous Vegetation

Phytomass

12/03/87 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	1	2	3	4	5	6	7	8	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	87	87	87	87	87	87	87	87	87	87
NUS Sample ID Number	1131	1132	1133	1134	1135	1136	1137	1138	1139	1140
Laboratory Number	840	841	842	843	844	845	846	847	848	849
Cations (ppm)										
Sodium	424.00	485.00	424.00	515.00	394.00	364.00	394.00	424.00	394.00	333.00
Potassium	11000.00	9565.00	11500.00	15000.00	12500.00	12500.00	16500.00	13000.00	13500.00	12000.00
Calcium	17050.00	13525.00	15762.00	15837.00	15525.00	13438.00	14075.00	16863.00	16112.00	13838.00
Magnesium	1413.00	1563.00	1650.00	2212.00	1762.00	1438.00	1913.00	1163.00	1225.00	1837.00
Anions (ppm)										
Chloride	8000.00	5200.00	6480.00	6800.00	4520.00	5800.00	5600.00	5600.00	5440.00	5400.00
Sulfate	3250.00	2083.00	4250.00	2417.00	2750.00	7024.00	3833.00	3333.00	2917.00	3833.00
Nitrate	21.00	31.00	21.00	34.00	46.00	40.00	48.00	73.00	67.00	30.00
Phosphate	1440.00	1338.00	1303.00	1372.00	1372.00	1303.00	1166.00	1372.00	1235.00	1166.00
Fluoride	17.00	16.00	16.00	16.00	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

12/03/87 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	87	87	87	87	87	87	87	87	87	87
NUS Sample ID Number	1141	1142	1143	1144	1145	1146	1147	1148	1149	1150
Laboratory Number	870	871	872	873	874	875	876	877	878	879
Cations (ppm)										
Sodium	417.00	417.00	444.00	361.00	389.00	444.00	444.00	472.00	389.00	333.00
Potassium	13500.00	10000.00	9200.00	8400.00	7600.00	12500.00	11500.00	11000.00	15000.00	12500.00
Calcium	19375.00	15463.00	18450.00	20675.00	20125.00	20462.00	14050.00	16575.00	17500.00	16300.00
Magnesium	1750.00	1288.00	1400.00	1475.00	1462.00	1637.00	1337.00	1813.00	1462.00	1188.00
Anions (ppm)										
Chloride	8200.00	6400.00	6200.00	7840.00	7440.00	10400.00	6400.00	8000.00	6480.00	5600.00
Sulfate	3750.00	3625.00	3500.00	2125.00	7589.00	3750.00	2500.00	5893.00	2875.00	2750.00
Nitrate	40.00	105.00	70.00	44.00	88.00	63.00	146.00	53.00	89.00	55.00
Phosphate	823.00	1029.00	823.00	857.00	892.00	1132.00	1097.00	892.00	960.00	960.00
Fluoride	15.00	14.00	13.00	13.00	13.00	12.00	11.00	11.00	11.00	10.00

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Indigenous Vegetation

Phytomass

12/03/87 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	87	87	87	87	87	87	87	87	87	87
NUS Sample ID Number	1151	1152	1153	1154	1155	1156	1157	1158	1159	1160
Laboratory Number	880	881	882	883	884	885	886	887	888	889
Cations (ppm)										
Sodium	41250.00	22917.00	45000.00	35000.00	46250.00	33750.00	36250.00	38750.00	41250.00	38750.00
Potassium	26667.00	25238.00	21905.00	20000.00	37857.00	27143.00	37143.00	19000.00	16500.00	26190.00
Calcium	7287.00	8637.00	5350.00	8662.00	7850.00	5000.00	8925.00	8863.00	8425.00	6975.00
Magnesium	5625.00	4225.00	4162.00	9875.00	4100.00	4862.00	8000.00	6875.00	7250.00	6250.00
Anions (ppm)										
Chloride	40400.00	66600.00	45600.00	43400.00	65400.00	42400.00	70800.00	34000.00	31000.00	39200.00
Sulfate	7143.00	6786.00	4250.00	6786.00	9286.00	4500.00	7857.00	6071.00	9643.00	15263.00
Nitrate	400.00	240.00	294.00	375.00	331.00	444.00	467.00	624.00	294.00	342.00
Phosphate	1303.00	1372.00	1235.00	1406.00	1338.00	1372.00	1406.00	1578.00	1097.00	1509.00
Fluoride	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00

APPENDIX F

AGRICULTURAL VEGETATION DATA

Appendix F

Agricultural Vegetation Data

Agricultural vegetation data were collected during the second, third, and fourth quarters of 1987. Sites 11, 13, 23, 25, 30, 31, and 32 were sampled during the second quarter; sites 11, 13, 25, and 32, during the third; and sites 11, 13, 23, 25, 30, 31, 32, and 43, during the fourth. Sites 11 and 13 were also sampled in July 1987. The data from this July sampling are presented as data for quarter 5 in the following tables. Leaf phytomass was analyzed for nine ions in the laboratory. No rinsate, leaf area, or leaf biomass data were reported in 1987. Cotton boll biomass data were reported during the third quarter only. No data were reported as missing during the 1987 data collection.

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Agricultural Vegetation

Phytomass

12/08/87 Crop: 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	6	6	6	6	6	6	6	6	6	6
Year	87	87	87	87	87	87	87	87	87	87
Row Number	5	5	21	21	83	83	124	124	138	138
Plot Number	1	2	3	4	5	6	7	8	9	10
Paces From End	31	79	16	215	94	232	90	65	238	148
NUS Sample ID Number	1001	1002	1003	1004	1005	1006	1007	1008	1009	1010
Laboratory Number	307	308	309	310	311	312	313	314	315	316
Cations (ppm)										
Sodium	6389.00	3545.00	3273.00	3545.00	2833.00	2083.00	3364.00	2500.00	1526.00	1211.00
Potassium	15789.00	18947.00	18947.00	18947.00	15789.00	16842.00	16316.00	16842.00	15263.00	15789.00
Calcium	38250.00	37250.00	37875.00	35875.00	29250.00	31750.00	38500.00	36625.00	29250.00	28625.00
Magnesium	4275.00	4625.00	4213.00	4250.00	4400.00	4338.00	4913.00	4825.00	3438.00	3500.00
Anions (ppm)										
Chloride	24600.00	18200.00	20400.00	20800.00	15400.00	16800.00	16800.00	15200.00	15600.00	13600.00
Sulfate	40000.00	43200.00	46400.00	41600.00	40000.00	41600.00	37333.00	51200.00	24000.00	28000.00
Nitrate	230.00	323.00	283.00	243.00	215.00	243.00	230.00	254.00	104.00	165.00
Phosphate	2538.00	2263.00	1989.00	2023.00	2263.00	2263.00	2435.00	2058.00	2572.00	2469.00
Fluoride	14.00	15.00	14.00	12.00	11.00	11.00	11.00	10.00	10.00	9.00
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

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Agricultural Vegetation

Phytomass

12/08/87 Crop: 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	6	6	6	6	6	6	6	6	6	6
Year	87	87	87	87	87	87	87	87	87	87
Row Number	32	32	90	90	98	98	124	124	133	133
Plot Number	1	2	3	4	5	6	7	8	9	10
Paces From End	232	204	83	90	216	32	98	31	21	201
NUS Sample ID Number	1061	1062	1063	1064	1065	1066	1067	1068	1069	1070
Laboratory Number	367	368	369	370	371	372	373	374	375	376
Cations (ppm)										
Sodium	2417.00	2231.00	3700.00	3600.00	2538.00	5405.00	3900.00	8649.00	5135.00	2308.00
Potassium	16667.00	18571.00	17143.00	17143.00	15238.00	21667.00	16190.00	16190.00	15238.00	14286.00
Calcium	37250.00	42500.00	34125.00	36250.00	45375.00	39250.00	41125.00	41875.00	41875.00	43625.00
Magnesium	6125.00	4988.00	5250.00	5625.00	4313.00	6250.00	5750.00	7000.00	5625.00	4288.00
Anions (ppm)										
Chloride	17000.00	16400.00	17400.00	18160.00	19600.00	18000.00	19400.00	17600.00	19600.00	17200.00
Sulfate	43636.00	33393.00	35893.00	42360.00	25893.00	37143.00	32143.00	34643.00	25893.00	33393.00
Nitrate	343.00	325.00	303.00	208.00	138.00	245.00	169.00	101.00	190.00	245.00
Phosphate	2058.00	2538.00	2675.00	2469.00	2881.00	2332.00	2469.00	2366.00	2401.00	2641.00
Fluoride	9.00	12.00	13.00	13.00	11.00	12.00	12.00	13.00	13.00	11.00
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

12/08/87 Crop: ALFALFA

Monitoring Location	0023	0023	0023	0023	0023	0023	0023	0023	0023	0023
Quarter	2	2	2	2	2	2	2	2	2	2
Month	6	6	6	6	6	6	6	6	6	6
Year	87	87	87	87	87	87	87	87	87	87
Row Number	82	82	103	103	147	147	237	237	282	282
Plot Number	1	2	3	4	5	6	7	8	9	10
Paces From End	110	76	117	212	206	149	71	29	74	46
NUS Sample ID Number	1021	1022	1023	1024	1025	1026	1027	1028	1029	1030
Laboratory Number	327	328	329	330	331	332	333	334	335	336
Cations (ppm)										
Sodium	2615.00	1733.00	3636.00	3545.00	3545.00	3000.00	1733.00	2769.00	2000.00	1867.00
Potassium	34000.00	32667.00	30000.00	32667.00	30000.00	29474.00	32667.00	32000.00	32000.00	30000.00
Calcium	13775.00	15050.00	11138.00	13775.00	12863.00	12787.00	14350.00	16613.00	15563.00	15463.00
Magnesium	2663.00	2625.00	2275.00	1688.00	2400.00	2550.00	2650.00	2838.00	2775.00	2663.00
Anions (ppm)										
Chloride	16800.00	13800.00	15600.00	14600.00	15400.00	16600.00	18800.00	17000.00	15600.00	16000.00
Sulfate	10882.00	12941.00	9375.00	11765.00	9375.00	11765.00	16471.00	14706.00	14118.00	15882.00
Nitrate	331.00	440.00	224.00	458.00	316.00	176.00	100.00	180.00	118.00	145.00
Phosphate	3498.00	3224.00	3087.00	3121.00	3704.00	3841.00	3361.00	3361.00	3498.00	3841.00
Fluoride	10.00	10.00	13.00	11.00	12.00	10.00	10.00	10.00	9.00	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

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Agricultural Vegetation

Phytomass

12/08/87 Crop: PIMA COTTON

Monitoring Location	0025	0025	0025	0025	0025	0025	0025	0025	0025	0025
Quarter	2	2	2	2	2	2	2	2	2	2
Month	6	6	6	6	6	6	6	6	6	6
Year	87	87	87	87	87	87	87	87	87	87
Row Number	47	47	50	50	56	56	62	62	158	158
Plot Number	1	2	3	4	5	6	7	8	9	10
Paces From End	31	241	52	96	293	265	167	20	251	37
NUS Sample ID Number	1071	1072	1073	1074	1075	1076	1077	1079	1080	1078
Laboratory Number	377	378	379	380	381	382	383	385	386	384
Cations (ppm)										
Sodium	486.00	432.00	486.00	486.00	405.00	459.00	459.00	432.00	595.00	649.00
Potassium	23333.00	26111.00	26111.00	22222.00	22222.00	22222.00	22778.00	19048.00	26111.00	25556.00
Calcium	39625.00	31500.00	34625.00	35750.00	32875.00	37875.00	41125.00	38125.00	44875.00	47250.00
Magnesium	3788.00	2913.00	3083.00	3425.00	3163.00	3475.00	3825.00	3025.00	3550.00	3713.00
Anions (ppm)										
Chloride	18800.00	17000.00	14400.00	14600.00	16000.00	15600.00	14800.00	13400.00	16000.00	17320.00
Sulfate	32143.00	17460.00	22321.00	29821.00	23393.00	26071.00	28571.00	24821.00	22321.00	23571.00
Nitrate	245.00	153.00	195.00	170.00	205.00	328.00	310.00	335.00	368.00	313.00
Phosphate	2572.00	2675.00	2778.00	2881.00	2675.00	2675.00	2538.00	2572.00	2469.00	2298.00
Fluoride	12.00	12.00	14.00	14.00	15.00	18.00	16.00	16.00	14.00	16.00
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

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Agricultural Vegetation

Phytomass

12/08/87 Crop: ALFALFA

Monitoring Location	0030	0030	0030	0030	0030	0030	0030	0030	0030	0030
Quarter	2	2	2	2	2	2	2	2	2	2
Month	6	6	6	6	6	6	6	6	6	6
Year	87	87	87	87	87	87	87	87	87	87
Row Number	76	76	123	123	141	141	191	191	227	227
Plot Number	1	2	3	4	5	6	7	8	9	10
Paces From End	205	36	16	232	36	115	142	96	219	109
NUS Sample ID Number	1011	1012	1013	1014	1015	1016	1017	1018	1019	1020
Laboratory Number	317	318	319	320	321	322	323	324	325	326
Cations (ppm)										
Sodium	972.00	972.00	1053.00	1000.00	1053.00	917.00	583.00	1368.00	1947.00	1737.00
Potassium	25000.00	29000.00	23000.00	18947.00	23500.00	25500.00	22000.00	23000.00	23500.00	26000.00
Calcium	13863.00	14263.00	16150.00	15938.00	16213.00	12875.00	12737.00	13288.00	11163.00	10188.00
Magnesium	1925.00	2225.00	2288.00	1988.00	2050.00	1775.00	1513.00	1950.00	1663.00	1800.00
Anions (ppm)										
Chloride	12400.00	12200.00	10400.00	11400.00	11800.00	12400.00	11800.00	12600.00	12000.00	12200.00
Sulfate	9500.00	12000.00	10000.00	12000.00	11333.00	10667.00	11333.00	10667.00	10667.00	12000.00
Nitrate	371.00	426.00	384.00	235.00	295.00	190.00	335.00	569.00	275.00	175.00
Phosphate	2606.00	2675.00	2538.00	2504.00	2332.00	2195.00	2641.00	2469.00	2675.00	2744.00
Fluoride	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00
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

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Agricultural Vegetation

Phytomass

12/08/87 Crop: COTTON

Monitoring Location	0031	0031	0031	0031	0031	0031	0031	0031	0031	0031
Quarter	2	2	2	2	2	2	2	2	2	2
Month	6	6	6	6	6	6	6	6	6	6
Year	87	87	87	87	87	87	87	87	87	87
Row Number	31	31	52	52	96	96	241	241	293	293
Plot Number	1	2	3	4	5	6	7	8	9	10
Paces From End	13	134	39	189	211	84	220	172	223	123
NUS Sample ID Number	1051	1052	1053	1054	1055	1056	1057	1058	1059	1060
Laboratory Number	357	358	359	360	361	362	363	364	365	366
Cations (ppm)										
Sodium	3250.00	5000.00	5556.00	3583.00	5556.00	5833.00	6667.00	5556.00	10500.00	7778.00
Potassium	13810.00	15238.00	14286.00	14762.00	13810.00	14762.00	14762.00	13333.00	15714.00	14286.00
Calcium	34375.00	29375.00	37500.00	36000.00	30250.00	31625.00	36875.00	29375.00	28000.00	34250.00
Magnesium	5375.00	5625.00	5875.00	6375.00	5375.00	5875.00	6625.00	5750.00	5625.00	6875.00
Anions (ppm)										
Chloride	20000.00	14800.00	18600.00	17000.00	20600.00	16400.00	18200.00	16800.00	16200.00	16800.00
Sulfate	25000.00	30000.00	32500.00	31250.00	21250.00	30000.00	36250.00	22500.00	30000.00	28750.00
Nitrate	219.00	228.00	270.00	258.00	119.00	273.00	223.00	136.00	125.00	149.00
Phosphate	2606.00	2572.00	2538.00	2263.00	2744.00	2606.00	2435.00	2058.00	2126.00	2058.00
Fluoride	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00
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

12/08/87 Crop: COTTON

Monitoring Location	0032	0032	0032	0032	0032	0032	0032	0032	0032	0032
Quarter	2	2	2	2	2	2	2	2	2	2
Month	6	6	6	6	6	6	6	6	6	6
Year	87	87	87	87	87	87	87	87	87	87
Row Number	98	98	133	133	140	140	244	244	263	263
Plot Number	1	2	3	4	5	6	7	8	9	10
Paces From End	147	127	123	203	77	181	127	61	70	128
NUS Sample ID Number	1041	1042	1043	1044	1045	1046	1047	1048	1049	1050
Laboratory Number	347	348	349	350	351	352	353	354	355	356
Cations (ppm)										
Sodium	8333.00	8611.00	10500.00	8889.00	12000.00	13500.00	13500.00	14500.00	12000.00	13000.00
Potassium	12857.00	13333.00	11905.00	13810.00	18095.00	12381.00	15714.00	15714.00	15714.00	15238.00
Calcium	30500.00	33250.00	43625.00	39375.00	39250.00	32875.00	33375.00	32500.00	33375.00	28250.00
Magnesium	5875.00	6125.00	7875.00	7125.00	7125.00	6000.00	6125.00	5875.00	6750.00	5500.00
Anions (ppm)										
Chloride	18200.00	18000.00	16200.00	17400.00	15800.00	18200.00	19600.00	15400.00	18600.00	15600.00
Sulfate	23750.00	22500.00	37500.00	41818.00	38750.00	32500.00	33750.00	38750.00	40000.00	31250.00
Nitrate	141.00	303.00	303.00	243.00	595.00	96.00	151.00	220.00	233.00	156.00
Phosphate	2401.00	2538.00	2058.00	2263.00	2538.00	2332.00	2298.00	2469.00	2332.00	2606.00
Fluoride	10.00	9.00	10.00	10.00	10.00	9.00	10.00	9.00	10.00	9.00
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

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Agricultural Vegetation

Phytomass

12/08/87 Crop: 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	7	7	7	7	7	7	7	7	7	7
Year	87	87	87	87	87	87	87	87	87	87
Row Number	5	5	21	21	83	83	124	124	138	138
Plot Number	1	2	3	4	5	6	7	8	9	10
Paces From End	31	79	16	215	94	232	90	65	238	148
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	871101	871102	871103	871104	871105	871106	871107	871108	871109	871110
Laboratory Boll ID	871101	871102	871103	871104	871105	871106	871107	871108	871109	871110
Boll Biomass (g/m2)	828.30	847.70	855.40	549.70	996.20	769.90	1036.90	970.10	914.00	609.20

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Agricultural Vegetation

Phytomass

12/08/87 Crop: 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	7	7	7	7	7	7	7	7	7	7
Year	87	87	87	87	87	87	87	87	87	87
Row Number	32	32	90	90	98	98	124	124	133	133
Plot Number	1	2	3	4	5	6	7	8	9	10
Paces From End	232	204	83	90	216	32	98	31	21	201
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	871311	871312	871313	871314	871315	871316	871317	871318	871319	871320
Laboratory Boll ID	871311	871312	871313	871314	871315	871316	871317	871318	871319	871320
Boll Biomass (g/m2)	570.90	803.60	947.70	783.80	992.30	790.70	795.90	703.40	901.70	800.80

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Agricultural Vegetation

Phytomass

12/08/87 Crop: PIMA COTTON

Monitoring Location	0025	0025	0025	0025	0025	0025	0025	0025	0025	0025
Quarter	3	3	3	3	3	3	3	3	3	3
Month	7	7	7	7	7	7	7	7	7	7
Year	87	87	87	87	87	87	87	87	87	87
Row Number	82	82	103	103	147	147	237	237	282	282
Plot Number	1	2	3	4	5	6	7	8	9	10
Paces From End	110	76	117	212	206	149	71	29	74	46
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	872521	872522	872523	872524	872525	872526	872527	872528	872529	872530
Laboratory Boll ID	872521	872522	872523	872524	872525	872526	872527	872528	872529	872530
Boll Biomass (g/m2)	337.90	460.50	539.20	331.40	420.20	592.60	382.70	308.20	192.00	320.20

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

Agricultural Vegetation

Phytomass

12/08/87 Crop: COTTON

Monitoring Location	0031	0031	0031	0031	0031	0031	0031	0031	0031	0031
Quarter	3	3	3	3	3	3	3	3	3	3
Month	7	7	7	7	7	7	7	7	7	7
Year	87	87	87	87	87	87	87	87	87	87
Row Number	47	47	50	50	56	56	62	62	158	158
Plot Number	1	2	3	4	5	6	7	8	9	10
Paces From End	31	241	52	96	293	265	167	20	251	37
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	873131	873132	873133	873134	873135	873136	873137	873138	873139	873140
Laboratory Boll ID	873131	873132	873133	873134	873135	873136	873137	873138	873139	873140
Boll Biomass (g/m2)	200.50	248.80	244.80	255.20	344.20	291.10	295.80	243.80	259.20	371.70

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Phytomass

12/08/87 Crop: COTTON

Monitoring Location	0032	0032	0032	0032	0032	0032	0032	0032	0032	0032
Quarter	3	3	3	3	3	3	3	3	3	3
Month	7	7	7	7	7	7	7	7	7	7
Year	87	87	87	87	87	87	87	87	87	87
Row Number	76	76	123	123	141	141	191	191	227	227
Plot Number	1	2	3	4	5	6	7	8	9	10
Paces From End	205	36	16	232	36	115	142	96	219	109
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	873241	873242	873243	873244	873245	873246	873247	873248	873249	873250
Laboratory Boll ID	873241	873242	873243	873244	873245	873246	873247	873248	873249	873250
Boll Biomass (g/m2)	175.20	97.50	281.40	279.80	226.40	225.90	226.30	136.40	136.40	156.90

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Agricultural Vegetation

Phytomass

12/08/87 Crop: 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	9	9	9	9	9	9	9	9	9	9
Year	87	87	87	87	87	87	87	87	87	87
Row Number	5	5	21	21	83	83	124	124	138	138
Plot Number	1	2	3	4	5	6	7	8	9	10
Paces From End	31	79	16	215	94	232	90	65	238	148
NUS Sample ID Number	1101	1102	1103	1104	1105	1106	1107	1108	1109	1110
Laboratory Number	648	649	650	651	652	653	654	655	656	657
Cations (ppm)										
Sodium	971.00	2667.00	2000.00	2000.00	5429.00	3818.00	6286.00	3091.00	5714.00	8571.00
Potassium	21111.00	23889.00	24444.00	20556.00	21111.00	20556.00	17727.00	22222.00	14091.00	15909.00
Calcium	26250.00	28000.00	29875.00	29625.00	41125.00	41875.00	66875.00	32000.00	81125.00	73000.00
Magnesium	4813.00	5013.00	5050.00	5875.00	7250.00	7250.00	5875.00	6500.00	7250.00	7000.00
Anions (ppm)										
Chloride	13800.00	20400.00	19600.00	14800.00	17860.00	23200.00	16400.00	16000.00	19600.00	17040.00
Sulfate	30714.00	35000.00	32143.00	37917.00	50417.00	41667.00	55417.00	36250.00	62083.00	60417.00
Nitrate	265.00	163.00	104.00	138.00	169.00	276.00	124.00	181.00	495.00	383.00
Phosphate	3910.00	3567.00	3635.00	2606.00	2401.00	1852.00	1646.00	2606.00	1372.00	1303.00
Fluoride	9.00	10.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00
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

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Phytomass

12/08/87 Crop: 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	9	9	9	9	9	9	9	9	9	9
Year	87	87	87	87	87	87	87	87	87	87
Row Number	32	32	90	90	98	98	124	124	133	133
Plot Number	1	2	3	4	5	6	7	8	9	10
Paces From End	232	204	83	90	216	32	98	31	21	201
NUS Sample ID Number	1111	1112	1113	1114	1152	1116	1117	1118	1119	1120
Laboratory Number	658	659	660	661	662	663	664	665	666	667
Cations (ppm)										
Sodium	3000.00	3182.00	4857.00	6286.00	3636.00	2500.00	8000.00	5143.00	5429.00	7714.00
Potassium	20000.00	21667.00	24444.00	25000.00	25000.00	21111.00	18636.00	21111.00	21667.00	20556.00
Calcium	42125.00	37375.00	37500.00	50625.00	34250.00	30625.00	55125.00	34125.00	43250.00	56375.00
Magnesium	6250.00	5050.00	6250.00	6500.00	6125.00	6375.00	6250.00	7125.00	5750.00	5875.00
Anions (ppm)										
Chloride	19280.00	15600.00	17600.00	22480.00	20800.00	20400.00	21720.00	22800.00	24400.00	22640.00
Sulfate	40417.00	42083.00	40417.00	50417.00	35417.00	30714.00	50833.00	33750.00	42083.00	50833.00
Nitrate	194.00	141.00	208.00	158.00	220.00	255.00	190.00	231.00	188.00	258.00
Phosphate	3361.00	3910.00	2469.00	1989.00	2606.00	2812.00	1921.00	2469.00	2538.00	1783.00
Fluoride	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00
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

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Agricultural Vegetation

Phytomass

12/08/87 Crop: ALFALFA

Monitoring Location	0023	0023	0023	0023	0023	0023	0023	0023	0023	0023
Quarter	4	4	4	4	4	4	4	4	4	4
Month	9	9	9	9	9	9	9	9	9	9
Year	87	87	87	87	87	87	87	87	87	87
Row Number	82	82	103	103	147	147	237	237	282	282
Plot Number	1	2	3	4	5	6	7	8	9	10
Paces From End	110	76	117	212	206	149	71	29	74	46
NUS Sample ID Number	1121	1122	1123	1124	1125	1126	1127	1128	1129	1130
Laboratory Number	668	669	670	671	672	673	674	675	676	677
Cations (ppm)										
Sodium	5294.00	3700.00	3500.00	3000.00	3800.00	4706.00	3100.00	4706.00	3800.00	3300.00
Potassium	31875.00	27647.00	31250.00	30625.00	30000.00	28235.00	32500.00	29412.00	31875.00	32500.00
Calcium	9450.00	10138.00	10988.00	12425.00	11338.00	10263.00	10988.00	10912.00	11188.00	13275.00
Magnesium	2425.00	2488.00	2550.00	2500.00	2575.00	2425.00	2288.00	2375.00	2488.00	2588.00
Anions (ppm)										
Chloride	12880.00	12200.00	16000.00	14000.00	12800.00	13400.00	15600.00	14200.00	15600.00	15800.00
Sulfate	11429.00	12143.00	10714.00	11429.00	12143.00	12857.00	10714.00	10714.00	10000.00	15000.00
Nitrate	370.00	328.00	420.00	408.00	475.00	254.00	395.00	457.00	475.00	615.00
Phosphate	3155.00	3567.00	3978.00	3018.00	3704.00	3635.00	3429.00	3361.00	3635.00	3498.00
Fluoride	13.00	13.00	12.00	11.00	12.00	12.00	10.00	15.00	12.00	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

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Agricultural Vegetation

Phytomass

12/08/87 Crop: COTTON

Monitoring Location	0025	0025	0025	0025	0025	0025	0025	0025	0025	0025
Quarter	4	4	4	4	4	4	4	4	4	4
Month	9	9	9	9	9	9	9	9	9	9
Year	87	87	87	87	87	87	87	87	87	87
Row Number	47	47	50	50	56	56	62	62	158	158
Plot Number	1	2	3	4	5	6	7	8	9	10
Paces From End	31	241	52	96	293	265	167	20	251	37
NUS Sample ID Number	1131	1132	1133	1134	1135	1136	1137	1138	1139	1140
Laboratory Number	678	679	680	681	682	683	684	685	686	687
Cations (ppm)										
Sodium	735.00	794.00	559.00	618.00	529.00	618.00	706.00	500.00	559.00	618.00
Potassium	18636.00	15455.00	19091.00	21176.00	20000.00	21176.00	15455.00	20000.00	13182.00	24706.00
Calcium	42250.00	67375.00	35625.00	44000.00	46625.00	55625.00	79125.00	40125.00	44500.00	38375.00
Magnesium	4638.00	5625.00	4613.00	4625.00	4925.00	3887.00	6000.00	4888.00	4700.00	3700.00
Anions (ppm)										
Chloride	19200.00	23200.00	16400.00	20600.00	20600.00	18200.00	19000.00	24800.00	18000.00	18800.00
Sulfate	27143.00	32857.00	18182.00	31429.00	34286.00	35714.00	49091.00	20000.00	37143.00	35714.00
Nitrate	676.00	170.00	149.00	315.00	216.00	115.00	149.00	1348.00	44.00	234.00
Phosphate	1921.00	1921.00	2195.00	2263.00	2195.00	2675.00	2332.00	1989.00	2058.00	1989.00
Fluoride	10.00	12.00	11.00	14.00	13.00	13.00	13.00	12.00	12.00	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

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Agricultural Vegetation

Phytomass

12/08/87 Crop: ALFALFA

Monitoring Location	0030	0030	0030	0030	0030	0030	0030	0030	0030	0030
Quarter	4	4	4	4	4	4	4	4	4	4
Month	9	9	9	9	9	9	9	9	9	9
Year	87	87	87	87	87	87	87	87	87	87
Row Number	76	76	123	123	141	141	191	191	227	227
Plot Number	1	2	3	4	5	6	7	8	9	10
Paces From End	205	36	16	232	36	115	142	96	219	109
NUS Sample ID Number	1141	1142	1143	1144	1145	1146	1147	1148	1149	1150
Laboratory Number	688	689	690	691	692	693	694	695	696	697
Cations (ppm)										
Sodium	1900.00	2231.00	2154.00	1750.00	2231.00	2462.00	2385.00	3545.00	1950.00	2000.00
Potassium	30000.00	28824.00	26471.00	26471.00	25882.00	27059.00	21765.00	25882.00	34000.00	25882.00
Calcium	10388.00	12938.00	10713.00	9338.00	9175.00	11775.00	9500.00	11138.00	13938.00	11913.00
Magnesium	1888.00	1800.00	1775.00	1500.00	1550.00	1838.00	1713.00	1900.00	2338.00	1938.00
Anions (ppm)										
Chloride	13000.00	12880.00	12200.00	12400.00	12880.00	12200.00	11200.00	16200.00	16000.00	11600.00
Sulfate	11333.00	12000.00	9091.00	7727.00	8636.00	11333.00	9091.00	9545.00	12000.00	9545.00
Nitrate	70.00	180.00	126.00	108.00	78.00	269.00	95.00	73.00	200.00	151.00
Phosphate	2401.00	2126.00	2126.00	1921.00	1715.00	2195.00	1921.00	2058.00	2263.00	1921.00
Fluoride	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00
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

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Agricultural Vegetation

Phytomass

12/08/87 Crop: COTTON

Monitoring Location	0031	0031	0031	0031	0031	0031	0031	0031	0031	0031
Quarter	4	4	4	4	4	4	4	4	4	4
Month	9	9	9	9	9	9	9	9	9	9
Year	87	87	87	87	87	87	87	87	87	87
Row Number	31	31	52	52	96	96	241	241	293	293
Plot Number	1	2	3	4	5	6	7	8	9	10
Paces From End	13	134	39	189	211	84	220	172	223	123
NUS Sample ID Number	1151	1152	1153	1154	1155	1156	1157	1158	1159	1160
Laboratory Number	698	699	700	701	702	703	704	705	706	707
Cations (ppm)										
Sodium	2846.00	14000.00	8571.00	15500.00	16500.00	12000.00	8857.00	8857.00	9143.00	8000.00
Potassium	18636.00	12737.00	12273.00	8333.00	7083.00	10909.00	13182.00	11364.00	14545.00	18636.00
Calcium	38125.00	37750.00	50500.00	47875.00	46875.00	50000.00	27375.00	27125.00	21950.00	23638.00
Magnesium	8375.00	9375.00	12500.00	10875.00	9625.00	10875.00	7000.00	7625.00	6500.00	7625.00
Anions (ppm)										
Chloride	23600.00	19000.00	22120.00	18800.00	18800.00	21000.00	14800.00	14800.00	12400.00	16000.00
Sulfate	53333.00	47619.00	59048.00	55238.00	62857.00	68571.00	33333.00	29333.00	30667.00	29333.00
Nitrate	100.00	56.00	66.00	56.00	38.00	41.00	146.00	123.00	101.00	85.00
Phosphate	1989.00	1509.00	1509.00	1989.00	1372.00	1303.00	2058.00	1921.00	2058.00	1921.00
Fluoride	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00
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

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Agricultural Vegetation

Phytomass

12/08/87 Crop: COTTON

Monitoring Location	0032	0032	0032	0032	0032	0032	0032	0032	0032	0032
Quarter	4	4	4	4	4	4	4	4	4	4
Month	9	9	9	9	9	9	9	9	9	9
Year	87	87	87	87	87	87	87	87	87	87
Row Number	98	98	133	133	140	140	244	244	263	263
Plot Number	1	2	3	4	5	6	7	8	9	10
Paces From End	147	127	123	203	77	181	127	61	70	128
NUS Sample ID Number	1161	1162	1163	1164	1165	1166	1167	1168	1169	1170
Laboratory Number	748	749	750	751	752	753	754	755	756	757
Cations (ppm)										
Sodium	13810.00	13333.00	15238.00	11905.00	18095.00	16667.00	22143.00	23571.00	19048.00	19524.00
Potassium	14000.00	11500.00	10000.00	9565.00	11500.00	10500.00	11500.00	14500.00	15500.00	13500.00
Calcium	35125.00	32750.00	29750.00	27500.00	43250.00	26500.00	38125.00	31875.00	37500.00	42875.00
Magnesium	7875.00	7500.00	8250.00	7250.00	8000.00	7000.00	7625.00	6500.00	7375.00	7250.00
Anions (ppm)										
Chloride	18640.00	18640.00	15280.00	15800.00	18480.00	15600.00	20400.00	20120.00	20600.00	18120.00
Sulfate	30667.00	26667.00	32000.00	25333.00	50000.00	38667.00	50000.00	46000.00	40000.00	40000.00
Nitrate	94.00	66.00	114.00	45.00	193.00	103.00	69.00	79.00	63.00	70.00
Phosphate	2058.00	1989.00	2401.00	2263.00	1783.00	2263.00	1989.00	1921.00	1989.00	1989.00
Fluoride	14.00	13.00	17.00	13.00	18.00	16.00	17.00	17.00	16.00	15.00
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

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Agricultural Vegetation

Phytomass

12/08/87 Crop: ALFALFA

Monitoring Location	0043	0043	0043	0043	0043	0043	0043	0043	0043	0043
Quarter	4	4	4	4	4	4	4	4	4	4
Month	9	9	9	9	9	9	9	9	9	9
Year	87	87	87	87	87	87	87	87	87	87
Row Number	31	31	65	65	80	80	108	108	123	123
Plot Number	1	2	3	4	5	6	7	8	9	10
Paces From End	111	91	164	140	29	79	61	181	62	140
NUS Sample ID Number	1171	1172	1173	1174	1175	1176	1177	1178	1179	1180
Laboratory Number	708	709	710	711	712	713	714	715	716	717
Cations (ppm)										
Sodium	2267.00	1474.00	4000.00	1842.00	4000.00	1000.00	1474.00	1737.00	1053.00	1684.00
Potassium	26316.00	27895.00	26842.00	31250.00	25263.00	25789.00	23684.00	24737.00	25789.00	24737.00
Calcium	12563.00	14338.00	13838.00	12125.00	13850.00	14250.00	14550.00	14338.00	15713.00	12600.00
Magnesium	2825.00	2463.00	2400.00	2625.00	2938.00	2713.00	2850.00	2850.00	2688.00	2688.00
Anions (ppm)										
Chloride	18400.00	19000.00	18400.00	14200.00	18000.00	15000.00	17680.00	16480.00	15800.00	17400.00
Sulfate	10769.00	14615.00	10769.00	15385.00	10000.00	7500.00	9500.00	13077.00	10769.00	8500.00
Nitrate	534.00	564.00	718.00	699.00	625.00	356.00	344.00	328.00	454.00	265.00
Phosphate	3087.00	2744.00	3292.00	2949.00	3361.00	2881.00	3292.00	3155.00	3361.00	3155.00
Fluoride	11.00	15.00	10.00	10.00	10.00	9.00	9.00	9.00	9.00	9.00
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

12/08/87 Crop: COTTON

Monitoring Location	0011	0011	0011	0011	0011	0011	0011	0011	0011	0011
Quarter	5	5	5	5	5	5	5	5	5	5
Month	7	7	7	7	7	7	7	7	7	7
Year	87	87	87	87	87	87	87	87	87	87
Row Number	5	5	21	21	83	83	124	124	138	138
Plot Number	1	2	3	4	5	6	7	8	9	10
Paces From End	31	79	16	215	94	232	90	65	238	148
NUS Sample ID Number	1091	1092	1093	1094	1095	1096	1097	1098	1099	1100
Laboratory Number	604	605	606	607	608	609	610	611	612	613
Cations (ppm)										
Sodium	7027.00	5135.00	5946.00	5405.00	5405.00	5676.00	4324.00	5135.00	5405.00	5135.00
Potassium	10952.00	14762.00	11905.00	13810.00	15238.00	9259.00	10476.00	8519.00	14762.00	15238.00
Calcium	51750.00	42500.00	53750.00	48500.00	45000.00	50125.00	50125.00	50375.00	43500.00	31500.00
Magnesium	4575.00	4813.00	4375.00	4988.00	4913.00	4838.00	4875.00	4450.00	4688.00	4400.00
Anions (ppm)										
Chloride	18520.00	18400.00	18800.00	17800.00	14200.00	15600.00	14200.00	15200.00	13200.00	14800.00
Sulfate	50100.00	41750.00	51350.00	51350.00	46200.00	54200.00	47800.00	50650.00	40700.00	33173.00
Nitrate	66.00	151.00	124.00	101.00	113.00	56.00	91.00	56.00	183.00	545.00
Phosphate	1303.00	1646.00	1509.00	1646.00	1372.00	1440.00	1509.00	1372.00	1646.00	1921.00
Fluoride	14.00	15.00	16.00	16.00	15.00	15.00	15.00	15.00	16.00	16.00
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

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Agricultural Vegetation

Phytomass

12/08/87 Crop: COTTON

Monitoring Location	0013	0013	0013	0013	0013	0013	0013	0013	0013	0013
Quarter	5	5	5	5	5	5	5	5	5	5
Month	7	7	7	7	7	7	7	7	7	7
Year	87	87	87	87	87	87	87	87	87	87
Row Number	85	85	90	90	98	98	124	124	133	133
Plot Number	1	2	3	4	5	6	7	8	9	10
Paces From End	232	204	83	90	216	32	98	31	21	201
NUS Sample ID Number	1081	1082	1083	1084	1085	1086	1087	1088	1089	1090
Laboratory Number	614	615	616	617	618	619	620	621	622	623
Cations (ppm)										
Sodium	8108.00	5946.00	7027.00	8919.00	8108.00	9459.00	13000.00	6216.00	6757.00	5946.00
Potassium	14762.00	10476.00	16667.00	12381.00	15238.00	13810.00	11429.00	16190.00	8889.00	10000.00
Calcium	37875.00	42875.00	55625.00	51250.00	44625.00	50375.00	50625.00	45250.00	51000.00	48250.00
Magnesium	5625.00	5088.00	6125.00	6500.00	6375.00	6625.00	6750.00	6250.00	5750.00	5875.00
Anions (ppm)										
Chloride	20200.00	22200.00	18600.00	19600.00	16000.00	21800.00	21800.00	16200.00	18800.00	17600.00
Sulfate	53500.00	47100.00	51900.00	56700.00	50300.00	48700.00	45500.00	50300.00	43900.00	49950.00
Nitrate	86.00	128.00	88.00	78.00	193.00	64.00	78.00	109.00	71.00	75.00
Phosphate	1372.00	1372.00	1440.00	1440.00	1372.00	1440.00	1509.00	1372.00	1303.00	1372.00
Fluoride	16.00	15.00	14.00	15.00	14.00	14.00	15.00	16.00	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

APPENDIX G

SOILS DATA

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 18 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 colocated samples (A and B) for the upper and lower levels (U and L). Samples collected during the second, third, and fourth quarters of 1987, 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." No total phosphorus data were reported during 1987.

	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 Soil Sample Data

For Quarter 2/87

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	87	4	WET	579	110	3.90	2496	8.0	575	31	270	576	309.0	87	0.0	0.44	220.00	1.04	3.33	0.87	13
01AU	2	87	4	WET	578	109	1.50	960	8.1	178	12	114	220	78.0	100	0.0	0.17	67.50	0.96	5.83	1.46	13
01BL	2	87	4	WET	581	112	1.52	973	8.1	146	9	156	232	42.0	117	0.0	0.38	70.00	1.56	1.67	0.87	6
01BU	2	87	4	WET	580	111	0.74	474	8.5	72	5	64	88	36.0	107	0.0	0.16	33.13	0.67	1.67	0.87	10
02AL	2	87	4	WET	575	106	0.50	320	9.1	23	5	109	44	4.0	248	10.0	0.80	7.19	0.74	5.00	2.04	16
02AU	2	87	4	WET	574	105	0.34	218	8.6	42	7	35	22	1.0	180	0.0	0.25	6.13	0.74	3.33	2.62	21
02BL	2	87	4	WET	577	108	1.40	896	9.6	28	6	303	224	44.0	330	76.0	1.40	15.63	2.22	5.00	3.49	19
02BU	2	87	4	WET	576	107	0.40	256	8.9	26	5	73	28	7.0	214	5.0	0.33	7.19	0.67	1.67	3.78	24
03AL	2	87	4	WET	587	118	10.00	6400	8.9	60	12	2486	2880	313.0	141	38.0	12.00	150.00	51.85	0.00	2.04	27
03AU	2	87	4	WET	586	117	3.70	2368	9.2	21	2	756	936	95.0	233	24.0	4.40	50.00	22.22	1.67	2.62	19
03BL	2	87	4	WET	589	120	11.00	7040	8.9	71	14	2703	2880	375.0	126	33.0	11.00	140.00	55.56	0.00	1.46	30
03BU	2	87	4	WET	588	119	2.90	1856	9.3	21	2	600	670	63.0	218	22.0	3.60	37.50	15.56	0.00	1.46	14
04AL	2	87	4	WET	567	98	0.34	218	8.3	66	5	14	12	15.0	168	2.0	0.36	4.25	0.58	3.00	1.46	14
04AU	2	87	4	WET	566	97	0.30	192	8.4	66	5	14	8	15.0	175	0.0	0.32	3.75	0.67	2.00	1.46	13
04BL	2	87	4	WET	569	100	0.30	192	8.3	61	5	14	16	0.0	155	2.0	0.35	5.13	0.67	2.00	1.16	13
04BU	2	87	4	WET	568	99	0.30	192	8.4	61	5	13	10	16.0	160	0.0	0.28	4.13	0.67	2.00	1.75	13
05AL	2	87	4	WET	559	90	0.72	461	9.1	30	8	148	30	24.0	286	18.0	13.50	8.44	2.08	2.00	2.04	6
05AU	2	87	4	WET	558	89	0.50	320	8.7	33	4	78	16	20.0	216	5.0	4.30	11.25	1.58	2.00	2.62	16
05BL	2	87	4	WET	561	92	0.64	410	9.1	31	6	132	19	2.0	322	22.0	12.50	8.75	2.25	2.00	2.04	6
0[illegible]	[illegible]	87	4	WET	560	91	0.46	294	8.7	32	4	83	16	19.0	233	5.0	4.30	8.13	1.50	2.00	2.62	14
06[illegible]	[illegible]	87	4	WET	563	94	0.44	282	9.0	34	3	92	16	3.0	248	7.0	0.94	4.50	1.25	2.00	2.04	3
06AU	2	87	4	WET	562	93	0.38	243	8.6	46	3	62	18	17.0	185	5.0	0.42	6.25	0.92	2.00	2.04	3
06BL	2	87	4	WET	565	96	0.32	205	8.7	33	2	62	14	12.0	187	5.0	0.39	3.63	0.75	1.00	1.16	2
06BU	2	87	4	WET	564	95	0.28	179	8.4	49	3	29	12	17.0	155	0.0	0.27	3.63	0.75	2.00	1.16	5
07AL	2	87	4	WET	727	261	0.78	499	9.0	26	4	149	72	45.0	204	5.0	3.10	18.75	1.15	1.67	3.49	11
07AU	2	87	4	WET	726	260	0.88	563	8.7	26	5	150	92	38.0	206	2.0	3.00	27.50	2.31	2.00	2.91	14
07BL	2	87	4	WET	729	263	0.52	333	9.0	36	5	117	20	38.0	238	5.0	3.70	10.00	1.77	1.67	2.04	6
07BU	2	87	4	WET	728	262	0.44	282	8.8	30	6	80	20	28.0	204	2.0	2.60	9.38	1.00	2.50	2.04	8
08AL	2	87	4	WET	623	154	2.90	1856	9.7	18	2	278	612	200.0	252	45.0	1.90	28.75	8.67	1.67	3.78	22
08AU	2	87	4	WET	622	153	0.82	525	9.2	24	4	157	144	22.0	182	19.0	0.65	8.44	0.92	2.50	2.91	20
08BL	2	87	4	WET	625	156	1.48	947	9.7	18	2	267	320	61.0	189	33.0	1.70	10.75	3.83	0.00	2.04	11
08BU	2	87	4	WET	624	155	0.44	282	9.1	21	3	92	58	6.0	163	24.0	0.58	6.00	1.17	0.00	3.20	12
09AL	2	87	4	WET	639	170	0.46	294	8.6	26	5	69	48	15.0	187	0.0	0.30	9.38	0.83	5.00	2.33	32
09AU	2	87	4	WET	638	169	0.34	218	8.3	42	6	26	10	13.0	185	0.0	0.19	6.00	0.92	5.68	1.75	24
09BL	2	87	4	WET	641	172	0.48	307	8.6	29	6	59	56	15.0	185	0.0	0.24	8.75	1.08	5.00	3.20	37
09BU	2	87	4	WET	640	171	0.36	230	8.3	46	7	19	12	19.0	175	0.0	0.16	10.63	1.08	5.68	3.49	27
10AL	2	87	4	WET	571	102	0.36	230	8.7	45	6	35	24	13.0	153	0.0	0.73	8.44	0.67	3.33	0.87	8
10AU	2	87	4	WET	570	101	0.34	218	8.6	50	5	19	12	11.0	160	0.0	0.43	6.25	0.74	1.67	1.46	11
10BL	2	87	4	WET	573	104	0.40	256	8.7	39	4	58	38	11.0	175	0.0	0.74	6.56	0.89	1.67	0.87	6
10BU	2	87	4	WET	572	103	0.28	179	8.7	46	5	18	8	8.0	168	0.0	0.51	4.38	0.74	1.67	1.75	13
11AL	2	87	4	WET	627	158	0.96	614	8.6	40	3	222	100	52.0	219	0.0	18.50	19.69	1.92	4.17	1.16	18
11AU	2	87	4	WET	626	157	2.40	1536	8.1	113	9	400	412	188.0	131	0.0	6.90	72.50	2.67	3.33	1.46	35
11BL	2	87	4	WET	629	160	1.84	1178	8.3	83	7	333	320	119.0	136	0.0	9.80	51.25	2.42	1.67	1.16	29
1[illegible]	[illegible]	87	4	WET	628	159	5.60	3584	7.9	439	33	778	1184	296.0	95	0.0	5.40	190.00	2.75	5.00	1.16	58

Raw Soil Sample Data

For Quarter 2/87

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	87	4	WET	607	138	2.10	1344	8.6	52	6	162	352	140.0	180	0.0	9.60	45.63	4.09	1.67	2.91	55
12AU	2	87	4	WET	606	137	2.20	1408	8.5	65	7	389	356	200.0	160	0.0	7.60	60.00	3.36	2.50	3.20	59
12BL	2	87	4	WET	609	140	1.72	1101	8.4	63	7	249	262	127.0	182	0.0	9.40	37.50	2.55	2.50	3.89	51
12BU	2	87	4	WET	608	139	1.72	1101	8.5	61	6	281	220	193.0	185	0.0	7.20	50.00	2.73	2.50	3.20	53
13AL	2	87	4	WET	611	142	0.80	512	8.7	32	4	150	108	45.0	180	0.0	10.50	11.25	1.25	5.00	2.04	14
13AU	2	87	4	WET	610	141	1.06	678	8.7	35	3	211	168	54.0	170	0.0	0.80	18.13	1.50	3.33	2.33	17
13BL	2	87	4	WET	613	144	1.00	640	8.8	29	3	222	152	57.0	194	0.0	9.60	14.06	1.33	1.67	1.16	12
13BU	2	87	4	WET	612	143	1.36	870	8.5	49	5	222	254	71.0	143	0.0	6.80	25.63	1.75	1.67	1.75	17
14AL	2	87	4	WET	583	114	0.72	461	8.6	44	6	80	42	61.0	192	0.0	0.37	22.81	1.11	0.00	2.62	40
14AU	2	87	4	WET	582	113	0.88	563	8.7	48	8	58	40	91.0	202	0.0	0.19	37.50	1.85	1.67	3.49	107
14BL	2	87	4	WET	585	116	0.72	461	8.7	40	6	89	44	44.0	189	0.0	0.39	27.50	1.11	1.67	2.62	40
14BU	2	87	4	WET	584	115	0.88	563	8.5	55	9	58	36	73.0	199	0.0	0.23	41.25	1.78	3.33	3.49	99
15AL	2	87	4	WET	615	146	0.28	179	8.5	48	4	13	16	3.0	124	0.0	0.47	7.19	0.58	3.33	1.75	18
15AU	2	87	4	WET	614	145	0.28	179	8.5	55	4	10	12	13.0	211	0.0	0.30	5.31	0.50	2.50	2.33	18
15BL	2	87	4	WET	617	148	0.24	154	8.5	47	4	11	8	10.0	134	0.0	0.27	4.50	0.42	3.33	1.16	9
15BU	2	87	4	WET	616	147	0.24	154	8.5	53	4	10	8	10.0	148	0.0	0.17	4.00	0.58	5.00	1.46	14
16AL	2	87	4	WET	591	122	11.40	7296	9.3	48	10	3135	2830	636.0	172	62.0	3.85	306.25	61.82	0.83	1.75	99
16AU	2	87	4	WET	590	121	3.30	2112	9.3	27	3	779	712	87.0	197	33.0	1.08	85.00	20.91	1.67	4.37	46
16BL	2	87	4	WET	593	124	10.80	6912	9.3	43	9	674	2200	673.0	170	69.0	3.90	287.50	63.64	0.83	1.46	82
16BU	2	87	4	WET	592	123	2.90	1856	9.4	24	2	568	576	80.0	187	33.0	1.05	80.00	19.09	2.50	[illegible]	[illegible]
17AL	2	87	4	WET	659	190	0.62	397	8.6	70	12	14	10	8.0	221	0.0	0.11	31.25	2.58	7.05	[illegible]	[illegible]
17AU	2	87	4	WET	658	189	0.64	410	8.5	84	11	15	12	8.0	204	0.0	0.13	31.25	2.33	8.41	11.64	56
17BL	2	87	4	WET	661	192	0.66	422	8.5	70	12	14	8	14.0	204	0.0	0.11	33.13	2.33	5.68	6.69	86
17BU	2	87	4	WET	660	191	0.70	448	8.5	89	14	12	10	6.0	204	0.0	0.10	40.00	2.08	6.70	10.77	76
18AL	2	87	4	WET	635	166	0.26	166	8.2	51	4	16	14	3.0	163	0.0	0.42	4.19	0.67	4.00	1.16	3
18AU	2	87	4	WET	634	165	0.28	179	8.2	52	4	12	16	7.0	155	0.0	0.23	4.38	0.33	4.00	1.46	6
18BL	2	87	4	WET	637	168	0.24	154	8.1	50	3	15	10	3.0	153	0.0	0.34	3.88	0.42	4.00	1.16	3
18BU	2	87	4	WET	636	167	0.26	166	8.2	50	4	13	12	3.0	155	0.0	0.24	4.13	0.25	4.00	1.46	6
19AL	2	87	4	WET	631	162	0.42	269	8.6	36	4	24	14	18.0	185	0.0	0.68	10.94	1.58	5.00	2.33	71
19AU	2	87	4	WET	630	161	0.44	282	8.3	50	6	16	14	21.0	197	0.0	0.25	10.31	0.58	4.00	3.20	53
19BL	2	87	4	WET	633	164	0.34	218	8.7	31	4	23	16	11.0	199	0.0	0.68	4.38	0.75	3.00	2.62	64
19BU	2	87	4	WET	632	163	0.30	192	8.4	39	5	14	8	15.0	189	0.0	0.27	3.75	0.50	3.00	2.04	44
20AL	2	87	4	WET	551	82	0.56	358	9.3	40	15	136	20	0.0	387	23.0	9.00	5.63	2.00	2.00	3.78	37
20AU	2	87	4	WET	550	81	0.40	256	9.0	30	5	54	24	29.0	187	5.0	2.10	6.25	1.08	2.00	3.78	34
20BL	2	87	4	WET	553	84	0.54	346	9.4	26	8	128	21	0.0	398	30.0	7.80	6.88	1.83	2.00	3.20	24
20BU	2	87	4	WET	552	83	0.48	307	8.9	46	7	76	28	36.0	223	5.0	3.20	6.00	1.00	2.00	3.78	32
21AL	2	87	4	WET	715	249	0.80	512	9.7	14	10	238	76	9.0	320	55.0	0.94	3.31	1.38	0.00	1.75	17
21AU	2	87	4	WET	714	248	0.32	205	8.9	20	4	64	12	7.0	177	14.0	0.34	3.50	0.92	1.00	2.04	15
21BL	2	87	4	WET	717	251	0.94	602	10.0	34	9	274	98	12.0	302	82.0	1.30	3.75	2.38	0.00	2.04	20
21BU	2	87	4	WET	716	250	0.28	179	8.9	23	4	44	12	11.0	165	14.0	0.28	2.75	0.62	1.00	2.33	18
22AL	2	87	4	WET	719	253	0.20	128	8.4	38	3	11	12	11.0	119	0.0	0.32	2.88	0.54	0.00	0.58	6
22AU	2	87	4	WET	718	252	0.22	141	8.4	40	3	8	8	14.0	141	0.0	0.21	2.50	0.38	0.00	0.87	9
22BL	2	87	4	WET	721	255	0.20	128	8.4	41	3	11	14	10.0	121	0.0	0.34	3.56	0.46	0.00	0.58	3
22BU	2	87	4	WET	720	254	0.22	141	8.4	43	3	9	10	16.0	136	0.0	0.24	4.38	0.46	0.00	[illegible]	[illegible]

Raw Soil Sample Data

For Quarter 2/87

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	87	4	WET	671	202	0.90	576	9.0	33	3	184	74	48.0	300	17.0	14.20	4.63	2.23	3.33	2.33	9
23AU	2	87	4	WET	670	201	0.86	550	8.9	34	3	216	80	15.0	301	8.0	11.30	5.50	1.77	4.17	2.04	7
23BL	2	87	4	WET	673	204	0.86	550	8.9	39	3	184	79	45.0	305	17.0	14.50	4.25	1.92	3.33	1.75	7
23BU	2	87	4	WET	672	203	0.84	538	8.8	37	3	162	70	20.0	320	7.0	11.00	4.63	1.85	3.33	2.04	9
24AL	2	87	4	WET	735	269	2.00	1280	8.5	66	9	229	282	175.0	136	2.0	2.90	65.00	1.54	1.67	1.75	31
24AU	2	87	4	WET	734	268	1.88	1203	8.4	71	8	331	252	94.0	141	0.0	2.60	75.00	1.31	1.67	1.75	47
24BL	2	87	4	WET	737	271	2.10	1344	8.4	90	11	263	298	83.0	134	0.0	2.90	100.00	1.31	1.67	1.75	44
24BU	2	87	4	WET	736	270	2.36	1510	8.3	104	13	297	336	87.0	121	0.0	2.40	120.00	1.38	2.08	1.75	62
25AL	2	87	4	WET	599	130	0.44	282	8.4	62	6	32	40	56.0	151	0.0	0.24	7.81	0.55	2.50	2.62	12
25AU	2	87	4	WET	598	129	0.56	358	8.4	67	6	40	28	113.0	199	0.0	0.18	8.44	1.09	1.67	2.62	30
25BL	2	87	4	WET	601	132	0.40	256	8.5	55	7	31	36	55.0	185	0.0	0.27	6.56	0.64	1.67	2.62	9
25BU	2	87	4	WET	600	131	0.52	333	8.5	66	6	42	28	102.0	155	0.0	0.18	7.81	0.82	2.50	2.91	18
26AL	2	87	4	WET	731	265	0.28	179	8.6	42	3	34	24	19.0	155	0.0	0.55	4.00	0.62	2.50	0.58	3
26AU	2	87	4	WET	730	264	0.24	154	8.5	48	4	16	16	13.0	146	0.0	0.42	4.13	0.23	2.50	0.58	5
26BL	2	87	4	WET	733	267	0.22	141	8.5	44	3	23	12	16.0	131	0.0	0.58	3.75	0.38	0.83	1.16	3
26BU	2	87	4	WET	732	266	0.20	128	8.5	50	4	16	14	13.0	143	0.0	0.35	3.63	0.38	0.83	1.75	6
27AL	2	87	4	WET	555	86	1.00	640	9.6	13	4	281	56	255.0	539	105.0	25.00	10.63	3.92	1.00	2.04	45
27AU	2	87	4	WET	554	85	0.70	448	9.2	26	6	216	22	5.0	344	26.0	9.00	15.00	2.92	2.00	3.20	19
27BL	2	87	4	WET	557	88	1.48	947	9.4	25	6	335	123	135.0	461	31.0	17.00	16.88	6.17	2.00	2.62	14
[illegible]	[illegible]	87	4	WET	556	87	0.84	538	9.1	34	7	205	43	6.0	315	13.0	6.60	22.50	2.83	2.00	2.91	16
[illegible]	[illegible]	87	4	WET	663	194	0.56	358	9.2	20	2	132	26	80.0	219	10.0	2.00	6.25	1.58	2.50	0.58	4
28AU	2	87	4	WET	662	193	0.44	282	9.0	29	4	108	18	20.0	243	2.0	2.30	9.06	1.83	2.00	0.87	9
28BL	2	87	4	WET	665	196	0.74	474	9.0	22	2	156	84	68.0	197	7.0	1.00	8.44	1.75	3.00	0.58	6
28BU	2	87	4	WET	664	195	0.44	282	9.0	24	3	102	16	19.0	235	5.0	2.00	10.00	1.83	2.50	0.87	9
30AL	2	87	4	WET	675	206	5.20	3328	8.3	177	26	611	1160	527.0	163	0.0	3.70	67.50	5.23	2.50	1.16	40
30AU	2	87	4	WET	674	205	3.20	2048	8.4	88	13	442	580	388.0	204	5.0	4.80	34.38	4.62	1.67	1.46	30
30BL	2	87	4	WET	677	208	7.96	5094	8.1	394	56	1100	1650	836.0	141	0.0	2.80	130.00	5.77	5.00	1.46	60
30BU	2	87	4	WET	676	207	4.36	2790	8.4	123	18	900	950	473.0	189	0.0	4.20	57.50	5.54	5.75	0.87	34
31AL	2	87	4	WET	679	210	0.84	538	9.3	18	3	162	68	43.0	234	26.0	9.80	16.56	1.77	1.67	0.87	3
31AU	2	87	4	WET	678	209	1.00	640	9.3	19	3	195	70	43.0	310	20.0	8.00	25.00	2.00	1.67	0.87	4
31BL	2	87	4	WET	681	212	0.86	550	9.0	18	2	205	67	64.0	234	18.0	14.00	14.06	1.31	0.00	0.58	1
31BU	2	87	4	WET	680	211	0.76	486	9.2	17	3	160	46	30.0	246	11.0	8.40	21.25	2.00	0.00	1.16	3
32AL	2	87	4	WET	683	214	1.56	998	9.2	25	2	324	220	175.0	231	10.0	7.80	18.13	2.92	0.00	2.04	7
32AU	2	87	4	WET	682	213	1.60	1024	9.1	26	2	216	248	204.0	219	14.0	7.30	21.25	2.54	0.00	1.75	9
32BL	2	87	4	WET	685	216	1.68	1075	9.1	28	2	400	236	218.0	243	7.0	8.00	26.25	2.62	0.00	1.75	7
32BU	2	87	4	WET	684	215	1.76	1126	9.1	28	2	378	232	233.0	238	5.0	7.20	28.75	2.69	0.00	2.04	9
33AL	2	87	4	WET	687	218	0.22	141	8.5	38	3	15	26	14.0	117	0.0	0.30	3.25	0.00	0.00	2.62	12
33AU	2	87	4	WET	686	217	0.20	128	8.5	34	3	13	16	13.0	97	0.0	0.35	3.63	0.08	0.00	4.37	10
33BL	2	87	4	WET	689	220	0.18	115	8.5	40	3	13	16	3.0	92	0.0	0.27	2.75	0.00	0.00	2.33	9
33BU	2	87	4	WET	688	219	0.18	115	8.5	34	3	14	20	10.0	87	0.0	0.25	2.81	0.08	0.00	5.24	9
34AL	2	87	4	WET	691	225	0.26	166	8.0	52	3	12	10	7.0	143	0.0	0.19	4.25	0.31	2.50	0.87	8
34AU	2	87	4	WET	690	224	0.24	154	8.0	51	3	9	12	7.0	151	0.0	0.20	4.25	0.38	3.75	1.16	8
34BL	2	87	4	WET	693	227	0.24	154	8.1	51	3	15	16	13.0	148	0.0	0.25	3.13	0.38	0.00	0.58	6
[illegible]	[illegible]	87	4	WET	692	226	0.22	141	8.1	47	3	9	12	14.0	131	0.0	0.18	3.13	0.38	1.25	0.87	6

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Raw Soil Sample Data

For Quarter 2/87

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	87	4	WET	695	229	0.24	154	8.1	49	3	9	10	11.0	90	0.0	0.16	8.75	0.69	1.25	3.49	14
35AU	2	87	4	WET	694	228	0.20	128	8.0	39	3	5	8	14.0	100	0.0	0.09	5.13	0.69	1.25	6.11	18
35BL	2	87	4	WET	697	231	0.18	115	8.2	44	3	11	8	11.0	121	0.0	0.26	3.13	0.46	0.00	1.16	5
35BU	2	87	4	WET	696	230	0.16	102	8.1	36	2	5	12	7.0	107	0.0	0.13	3.63	0.38	1.25	4.07	8
36AL	2	87	4	WET	699	233	3.10	1984	7.7	267	20	292	576	144.0	112	0.0	0.31	20.00	0.92	1.25	0.58	12
36AU	2	87	4	WET	698	232	1.26	806	7.8	128	9	114	214	38.0	124	0.0	0.14	37.50	0.54	1.25	0.58	14
36BL	2	87	4	WET	701	235	2.40	1536	7.9	150	13	346	416	167.0	131	0.0	1.45	77.50	4.08	5.00	0.58	12
36BU	2	87	4	WET	700	234	0.96	614	7.9	97	7	86	168	18.0	151	0.0	0.16	30.00	0.92	8.75	0.58	14
37AL	2	87	4	WET	703	237	0.40	256	7.9	79	4	13	50	10.0	114	0.0	0.19	4.13	0.69	2.50	0.58	5
37AU	2	87	4	WET	702	236	0.40	256	8.0	79	5	10	48	7.0	170	0.0	0.23	4.50	0.77	1.88	1.16	8
37BL	2	87	4	WET	705	239	0.40	256	8.0	80	4	13	54	7.0	170	0.0	0.25	4.00	0.92	2.50	1.75	5
37BU	2	87	4	WET	704	238	0.38	243	8.0	78	4	9	52	10.0	175	0.0	0.17	3.25	0.85	3.75	1.75	8
38AL	2	87	4	WET	651	182	1.42	909	9.7	11	1	316	132	160.0	347	41.0	2.70	11.88	4.50	3.00	2.04	3
38AU	2	87	4	WET	650	181	0.58	371	9.2	18	3	136	32	40.0	248	19.0	0.50	5.63	1.25	3.00	1.75	4
38BL	2	87	4	WET	653	184	0.90	576	9.5	11	2	211	71	46.0	315	35.0	1.35	6.88	1.83	4.00	0.87	4
38BU	2	87	4	WET	652	183	0.46	294	9.1	16	3	114	20	29.0	240	17.0	0.48	4.38	0.67	4.00	1.46	4
39AL	2	87	4	WET	655	186	1.46	934	9.2	24	3	284	142	314.0	238	5.0	1.35	6.25	4.50	1.50	0.58	6
39AU	2	87	4	WET	654	185	1.90	1216	8.5	83	9	179	386	200.0	119	0.0	0.23	15.63	2.33	3.50	1.16	13
39BL	2	87	4	WET	657	188	3.10	1984	8.9	38	6	533	856	131.0	155	2.0	1.50	20.00	6.50	1.50	0.87	7
39BU	2	87	4	WET	656	187	1.60	1024	8.7	42	4	253	386	55.0	153	0.0	0.20	10.31	2.17	2.00	1.[illegible]	[illegible]
40AL	2	87	4	WET	595	126	1.18	755	8.3	88	16	128	104	218.0	151	0.0	2.20	30.00	1.45	3.33	2.04	18
40AU	2	87	4	WET	594	125	1.80	1152	8.2	131	24	259	184	318.0	165	0.0	1.95	55.00	2.18	3.33	2.33	27
40BL	2	87	4	WET	597	128	1.30	832	8.3	91	16	195	126	167.0	155	0.0	2.30	37.50	1.82	2.50	1.75	21
40BU	2	87	4	WET	596	127	1.64	1050	8.2	121	22	249	160	293.0	151	0.0	1.85	51.25	2.00	2.50	2.04	25
41AL	2	87	4	WET	723	257	1.10	704	8.7	26	3	226	232	44.0	170	7.0	0.48	7.50	2.31	1.00	0.00	6
41AU	2	87	4	WET	722	256	0.40	256	8.3	44	4	36	40	17.0	155	0.0	0.24	4.25	0.62	7.50	0.29	11
41BL	2	87	4	WET	725	259	2.04	1306	9.2	15	2	262	412	171.0	175	33.0	3.20	12.50	10.46	0.00	0.00	5
41BU	2	87	4	WET	724	258	0.90	576	8.5	32	3	150	180	38.0	151	2.0	0.26	6.88	2.00	0.00	0.00	8
42AL	2	87	4	WET	647	178	0.24	154	8.4	47	3	16	16	17.0	146	0.0	0.32	3.63	0.42	5.68	0.87	3
42AU	2	87	4	WET	646	177	0.20	128	8.3	45	3	10	10	7.0	155	0.0	0.22	3.13	0.33	5.68	0.87	5
42BL	2	87	4	WET	649	180	0.22	141	8.4	50	3	11	12	15.0	163	0.0	0.24	2.88	0.33	5.68	1.16	6
42BU	2	87	4	WET	648	179	0.22	141	8.4	51	3	10	12	10.0	165	0.0	0.19	2.94	0.42	6.36	0.87	8
43AL	2	87	4	WET	643	174	1.28	819	8.5	52	11	227	220	127.0	250	0.0	0.90	9.38	2.67	6.36	3.78	13
43AU	2	87	4	WET	642	173	1.36	870	8.6	56	11	130	224	133.0	257	0.0	1.05	6.13	2.75	6.36	3.49	16
43BL	2	87	4	WET	645	176	1.28	819	8.7	57	10	205	208	167.0	243	0.0	0.55	6.88	2.42	5.68	4.07	21
43BU	2	87	4	WET	644	175	1.10	704	8.5	63	10	141	188	153.0	262	0.0	1.15	5.25	2.08	6.36	3.78	14
44AL	2	87	4	WET	603	134	1.12	717	9.0	27	5	156	178	24.0	214	5.0	0.20	21.88	2.09	3.33	3.20	78
44AU	2	87	4	WET	602	133	0.34	218	8.7	33	5	25	16	13.0	172	0.0	0.12	5.50	0.73	2.50	2.91	46
44BL	2	87	4	WET	605	136	0.96	614	9.0	29	5	156	144	39.0	211	7.0	0.29	17.19	3.27	0.83	4.07	51
44BU	2	87	4	WET	604	135	0.40	256	8.7	32	5	32	20	12.0	175	2.0	0.15	9.69	1.27	2.50	4.37	53
45AL	2	87	4	WET	667	198	1.90	1216	9.4	14	2	295	214	267.0	274	26.0	22.00	8.44	4.92	5.00	0.00	3
45AU	2	87	4	WET	666	197	1.20	768	8.6	25	4	211	98	80.0	386	42.0	14.00	13.75	3.00	7.73	0.29	6
45BL	2	87	4	WET	669	200	3.70	2368	9.3	18	2	778	610	667.0	233	36.0	12.00	9.38	10.42	5.34	0.00	6
45BU	2	87	4	WET	668	199	1.90	1216	9.6	13	1	358	260	175.0	335	33.0	14.00	14.38	4.25	6.36	0.2[illegible]	[illegible]

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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	87	4	WET	579	110	2.28	0.56	45.16	2.24	9999.99
01AU	2	87	4	WET	578	109	1.22	0.68	39.42	1.99	9999.99
01BL	2	87	4	WET	581	112	1.65	0.51	37.67	1.50	9999.99
01BU	2	87	4	WET	580	111	0.91	0.85	41.17	1.99	9999.99
02AL	2	87	4	WET	575	106	2.07	0.93	32.43	3.04	9999.99
02AU	2	87	4	WET	574	105	0.63	1.30	33.68	3.04	9999.99
02BL	2	87	4	WET	577	108	6.53	1.54	31.44	3.49	9999.99
02BU	2	87	4	WET	576	107	1.17	1.51	24.74	2.79	9999.99
03AL	2	87	4	WET	587	118	16.97	1.05	21.68	2.26	9999.99
03AU	2	87	4	WET	586	117	4.35	1.23	23.57	1.91	9999.99
03BL	2	87	4	WET	589	120	16.97	1.05	21.26	2.30	9999.99
03BU	2	87	4	WET	588	119	7.73	1.14	23.63	1.95	9999.99
04AL	2	87	4	WET	567	98	0.35	0.87	35.68	1.27	9999.99
04AU	2	87	4	WET	566	97	0.40	0.87	36.18	1.34	9999.99
04BL	2	87	4	WET	569	100	0.38	0.84	35.93	1.27	9999.99
04BU	2	87	4	WET	568	99	0.47	0.90	36.18	1.34	9999.99
05AL	2	87	4	WET	559	90	2.28	0.49	23.80	1.52	9999.99
05AU	2	87	4	WET	558	89	0.96	0.95	22.77	1.73	9999.99
05BL	2	87	4	WET	561	92	2.14	0.49	23.88	1.52	9999.99
05BU	2	87	4	WET	560	91	1.05	0.84	21.91	1.52	9999.99
06AL	2	87	4	WET	563	94	2.14	0.29	38.55	1.58	9999.99
06AU	2	87	4	WET	562	93	1.01	0.41	35.55	1.54	9999.99
06BL	2	87	4	WET	565	96	1.28	0.31	40.54	1.50	9999.99
06BU	2	87	4	WET	564	95	0.56	0.43	39.17	1.62	9999.99
07AL	2	87	4	WET	727	261	1.65	0.49	21.48	2.73	9999.99
07AU	2	87	4	WET	726	260	2.09	0.68	21.78	2.79	9999.99
07BL	2	87	4	WET	729	263	1.44	0.43	21.69	2.55	9999.99
07BU	2	87	4	WET	728	262	1.04	0.49	21.28	2.51	9999.99
08AL	2	87	4	WET	623	154	5.07	0.98	18.48	1.34	9999.99
08AU	2	87	4	WET	622	153	1.86	0.91	20.40	1.69	9999.99
08BL	2	87	4	WET	625	156	4.83	0.67	19.06	1.27	9999.99
08BU	2	87	4	WET	624	155	1.51	0.78	20.77	1.60	9999.99
09AL	2	87	4	WET	639	170	0.17	2.46	22.47	2.73	9999.99
09AU	2	87	4	WET	638	169	0.48	1.42	24.73	2.77	9999.99
09BL	2	87	4	WET	641	172	0.87	1.98	21.48	2.65	9999.99
09BU	2	87	4	WET	640	171	0.44	1.45	23.84	2.71	9999.99
10AL	2	87	4	WET	571	102	0.58	0.51	24.48	1.95	9999.99
10AU	2	87	4	WET	570	101	0.41	0.59	24.40	1.83	9999.99
10BL	2	87	4	WET	573	104	0.75	0.45	24.20	1.83	9999.99
10BU	2	87	4	WET	572	103	0.39	0.63	23.19	1.64	9999.99
11AL	2	87	4	WET	627	158	3.32	1.84	28.07	1.71	9999.99
11AU	2	87	4	WET	626	157	2.90	1.60	31.69	1.60	9999.99
11BL	2	87	4	WET	629	160	3.48	1.71	32.93	1.75	9999.99
11BU	2	87	4	WET	628	159	8.22	1.60	34.68	1.89	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	87	4	WET	607	138	4.58	2.76	21.78	1.79	9999.99
12AU	2	87	4	WET	606	137	4.35	2.56	22.58	1.69	9999.99
12BL	2	87	4	WET	609	140	2.40	2.76	22.77	1.87	9999.99
12BU	2	87	4	WET	608	139	3.89	2.56	22.75	1.66	9999.99
13AL	2	87	4	WET	611	142	1.99	1.05	22.89	1.87	9999.99
13AU	2	87	4	WET	610	141	2.36	1.17	23.20	1.87	9999.99
13BL	2	87	4	WET	613	144	2.61	1.02	23.15	1.54	9999.99
13BU	2	87	4	WET	612	143	2.49	0.98	24.25	1.60	9999.99
14AL	2	87	4	WET	583	114	1.22	2.66	32.81	2.92	9999.99
14AU	2	87	4	WET	582	113	0.87	5.12	34.56	3.82	9999.99
14BL	2	87	4	WET	585	116	1.48	2.87	31.19	2.65	9999.99
14BU	2	87	4	WET	584	115	0.85	2.87	32.56	3.62	9999.99
15AL	2	87	4	WET	615	146	0.34	1.20	23.90	1.29	9999.99
15AU	2	87	4	WET	614	145	0.29	1.08	23.91	1.19	9999.99
15BL	2	87	4	WET	617	148	0.31	0.85	24.60	1.25	9999.99
15BU	2	87	4	WET	616	147	0.24	0.85	23.91	1.11	9999.99
16AL	2	87	4	WET	591	122	19.26	2.36	21.54	2.77	9999.99
16AU	2	87	4	WET	590	121	7.33	1.34	21.02	1.66	9999.99
16BL	2	87	4	WET	593	124	18.02	1.88	21.99	2.59	9999.99
16BU	2	87	4	WET	592	123	6.41	1.42	20.80	1.64	9999.99
17AL	2	87	4	WET	659	190	0.38	4.73	25.20	3.41	9999.99
17AU	2	87	4	WET	658	189	0.35	3.15	24.35	2.90	9999.99
17BL	2	87	4	WET	661	192	0.42	3.74	26.17	3.74	9999.99
17BU	2	87	4	WET	660	191	0.33	3.74	24.24	3.04	9999.99
18AL	2	87	4	WET	635	166	0.39	0.49	32.19	1.50	9999.99
18AU	2	87	4	WET	634	165	0.34	0.73	31.94	1.48	9999.99
18BL	2	87	4	WET	637	168	0.36	0.53	32.19	1.56	9999.99
18BU	2	87	4	WET	636	167	0.34	0.62	30.31	1.38	9999.99
19AL	2	87	4	WET	631	162	0.53	4.51	22.90	1.85	9999.99
19AU	2	87	4	WET	630	161	0.39	3.28	22.75	1.64	9999.99
19BL	2	87	4	WET	633	164	0.56	4.10	22.34	2.10	9999.99
19BU	2	87	4	WET	632	163	0.36	2.46	22.26	1.66	9999.99
20AL	2	87	4	WET	551	82	2.28	1.41	22.53	2.28	9999.99
20AU	2	87	4	WET	550	81	0.80	1.41	20.95	1.85	9999.99
20BL	2	87	4	WET	553	84	2.34	1.46	22.24	2.30	9999.99
20BU	2	87	4	WET	552	83	0.92	1.28	22.09	1.97	9999.99
21AL	2	87	4	WET	715	249	3.39	1.29	19.16	1.60	9999.99
21AU	2	87	4	WET	714	248	0.92	0.95	21.01	1.87	9999.99
21BL	2	87	4	WET	717	251	5.69	1.43	19.25	1.87	9999.99
21BU	2	87	4	WET	716	250	0.73	0.98	20.47	1.87	9999.99
22AL	2	87	4	WET	719	253	0.28	0.37	22.02	0.82	9999.99
22AU	2	87	4	WET	718	252	0.26	0.47	21.41	0.84	9999.99
22BL	2	87	4	WET	721	255	0.28	0.28	21.32	0.72	9999.99
22BU	2	87	4	WET	720	254	0.26	0.39	21.54	0.80	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
23AL	2	87	4	WET	671	202	4.23	1.45	22.45	1.83	9999.99
23AU	2	87	4	WET	670	201	3.29	1.31	23.95	2.22	9999.99
23BL	2	87	4	WET	673	204	4.47	1.28	22.70	1.77	9999.99
23BU	2	87	4	WET	672	203	4.23	1.37	23.74	2.14	9999.99
24AL	2	87	4	WET	735	269	4.23	1.84	23.76	2.28	9999.99
24AU	2	87	4	WET	734	268	3.16	2.05	23.25	2.03	9999.99
24BL	2	87	4	WET	737	271	3.32	1.52	21.15	1.87	9999.99
24BU	2	87	4	WET	736	270	3.32	1.95	22.89	2.03	9999.99
25AL	2	87	4	WET	599	130	0.69	1.25	32.56	2.03	9999.99
25AU	2	87	4	WET	598	129	0.73	1.64	32.93	1.79	9999.99
25BL	2	87	4	WET	601	132	0.76	1.08	30.81	2.55	9999.99
25BU	2	87	4	WET	600	131	0.78	1.39	32.06	2.28	9999.99
26AL	2	87	4	WET	731	265	0.68	0.32	23.18	1.11	9999.99
26AU	2	87	4	WET	730	264	0.40	0.45	23.35	1.17	9999.99
26BL	2	87	4	WET	733	267	0.52	0.32	19.05	0.97	9999.99
26BU	2	87	4	WET	732	266	0.35	0.49	21.78	1.07	9999.99
27AL	2	87	4	WET	555	86	5.64	0.64	20.97	1.11	9999.99
27AU	2	87	4	WET	554	85	2.93	1.08	22.68	1.38	9999.99
27BL	2	87	4	WET	557	88	5.88	0.82	20.91	1.05	9999.99
27BU	2	87	4	WET	556	87	2.85	1.13	22.50	1.21	9999.99
28AL	2	87	4	WET	663	194	3.48	0.91	33.31	1.62	9999.99
28AU	2	87	4	WET	662	193	2.61	1.30	32.19	1.66	9999.99
28BL	2	87	4	WET	665	196	3.39	0.88	33.18	1.83	9999.99
28BU	2	87	4	WET	664	195	2.54	1.20	32.93	1.64	9999.99
30AL	2	87	4	WET	675	206	7.29	1.95	36.55	3.90	9999.99
30AU	2	87	4	WET	674	205	4.23	2.05	35.68	3.90	9999.99
30BL	2	87	4	WET	677	208	10.53	2.05	37.80	4.19	9999.99
30BU	2	87	4	WET	676	207	5.17	1.89	30.94	3.68	9999.99
31AL	2	87	4	WET	679	210	2.36	0.20	19.04	1.11	9999.99
31AU	2	87	4	WET	678	209	2.49	0.27	18.92	1.36	9999.99
31BL	2	87	4	WET	681	212	2.36	0.20	21.49	1.29	9999.99
31BU	2	87	4	WET	680	211	2.17	0.20	19.40	1.21	9999.99
32AL	2	87	4	WET	683	214	3.04	0.45	18.63	0.92	9999.99
32AU	2	87	4	WET	682	213	3.31	0.49	19.19	0.97	9999.99
32BL	2	87	4	WET	685	216	3.22	0.47	18.60	0.97	9999.99
32BU	2	87	4	WET	684	215	3.22	0.49	18.76	0.99	9999.99
33AL	2	87	4	WET	687	218	0.24	0.20	6.47	0.39	9999.99
33AU	2	87	4	WET	686	217	0.24	0.25	5.54	0.41	9999.99
33BL	2	87	4	WET	689	220	0.24	0.20	6.74	0.39	9999.99
33BU	2	87	4	WET	688	219	0.24	0.20	5.36	0.39	9999.99
34AL	2	87	4	WET	691	225	0.33	0.45	23.60	0.95	9999.99
34AU	2	87	4	WET	690	224	0.28	0.49	23.98	0.95	9999.99
34BL	2	87	4	WET	693	227	0.33	0.35	24.06	0.92	9999.99
34BU	2	87	4	WET	692	226	0.28	0.45	23.43	0.97	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
35AL	2	87	4	WET	695	229	0.24	0.43	12.26	0.62	9999.99
35AU	2	87	4	WET	694	228	0.21	0.49	10.88	0.49	9999.99
35BL	2	87	4	WET	697	231	0.26	0.30	15.59	0.70	9999.99
35BU	2	87	4	WET	696	230	0.24	0.32	11.71	0.45	9999.99
36AL	2	87	4	WET	699	233	2.87	0.51	33.81	1.87	9999.99
36AU	2	87	4	WET	698	232	1.28	1.08	29.57	2.38	9999.99
36BL	2	87	4	WET	701	235	2.96	0.54	32.68	1.89	9999.99
36BU	2	87	4	WET	700	234	0.96	1.05	35.30	2.22	9999.99
37AL	2	87	4	WET	703	237	0.33	0.35	31.81	1.03	9999.99
37AU	2	87	4	WET	702	236	0.28	0.49	31.19	1.13	9999.99
37BL	2	87	4	WET	705	239	0.31	0.32	30.94	0.95	9999.99
37BU	2	87	4	WET	704	238	0.28	0.54	30.69	1.01	9999.99
38AL	2	87	4	WET	651	182	12.18	0.37	34.56	2.77	9999.99
38AU	2	87	4	WET	650	181	4.94	0.54	38.92	2.98	9999.99
38BL	2	87	4	WET	653	184	8.46	0.43	36.55	3.04	9999.99
38BU	2	87	4	WET	652	183	3.04	0.45	37.18	2.67	9999.99
39AL	2	87	4	WET	655	186	4.70	0.33	27.44	2.84	9999.99
39AU	2	87	4	WET	654	185	3.39	0.56	35.18	2.84	9999.99
39BL	2	87	4	WET	657	188	7.76	0.33	30.19	2.57	9999.99
39BU	2	87	4	WET	656	187	3.48	0.63	34.56	2.24	9999.99
40AL	2	87	4	WET	595	126	1.93	1.54	31.69	3.90	9999.99
40AU	2	87	4	WET	594	125	2.11	1.51	32.93	3.78	9999.99
40BL	2	87	4	WET	597	128	2.05	1.54	30.06	3.84	9999.99
40BU	2	87	4	WET	596	127	2.05	1.51	32.19	3.84	9999.99
41AL	2	87	4	WET	723	257	2.20	0.35	21.18	1.25	9999.99
41AU	2	87	4	WET	722	256	0.54	0.61	21.44	1.48	9999.99
41BL	2	87	4	WET	725	259	5.43	0.35	16.04	0.82	9999.99
41BU	2	87	4	WET	724	258	1.60	0.54	19.57	1.11	9999.99
42AL	2	87	4	WET	647	178	0.34	0.27	23.98	0.97	9999.99
42AU	2	87	4	WET	646	177	0.31	0.41	24.05	1.09	9999.99
42BL	2	87	4	WET	649	180	0.31	0.53	25.34	1.17	9999.99
42BU	2	87	4	WET	648	179	0.27	0.58	24.24	1.09	9999.99
43AL	2	87	4	WET	643	174	2.61	0.85	23.15	3.37	9999.99
43AU	2	87	4	WET	642	173	2.61	0.93	22.70	3.62	9999.99
43BL	2	87	4	WET	645	176	2.61	1.20	24.26	3.43	9999.99
43BU	2	87	4	WET	644	175	2.05	0.76	22.34	2.94	9999.99
44AL	2	87	4	WET	603	134	3.66	6.75	24.44	3.19	9999.99
44AU	2	87	4	WET	602	133	0.57	4.53	23.63	2.59	9999.99
44BL	2	87	4	WET	605	136	4.12	6.05	23.98	3.33	9999.99
44BU	2	87	4	WET	604	135	0.76	5.82	23.91	2.94	9999.99
45AL	2	87	4	WET	667	198	4.23	0.47	25.24	1.89	9999.99
45AU	2	87	4	WET	666	197	4.00	0.63	24.74	2.01	9999.99
45BL	2	87	4	WET	669	200	8.70	0.61	24.38	1.69	9999.99
45BU	2	87	4	WET	668	199	6.35	0.61	23.44	1.83	9999.99

Raw Soil Sample Data

For Quarter 3/87

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	87	7	DRY	775	448	0.44	282	8.5	41	3	48	46	19.0	128	0.0	0.37	14.06	0.64	1.00	0.55	4
01AU	3	87	7	DRY	774	447	0.52	333	8.4	49	4	46	56	28.0	126	0.0	0.23	17.00	0.64	1.00	0.82	7
01BL	3	87	7	DRY	777	450	4.00	2560	8.1	553	29	286	400	390.0	60	0.0	0.44	230.00	2.36	1.00	0.55	13
01BU	3	87	7	DRY	776	449	1.64	1050	8.3	154	11	128	220	125.0	90	0.0	0.23	66.25	1.27	0.00	0.82	14
02AL	3	87	7	DRY	771	444	1.00	640	9.2	23	5	206	146	17.0	303	22.0	0.84	7.81	1.55	2.00	2.61	14
02AU	3	87	7	DRY	770	443	0.40	256	8.7	29	5	44	21	14.0	176	5.0	0.29	5.88	0.73	0.00	1.65	23
02BL	3	87	7	DRY	773	446	0.68	435	9.1	25	4	120	80	2.0	241	10.0	1.00	7.06	1.45	0.00	1.23	9
02BU	3	87	7	DRY	772	445	0.34	218	8.6	32	5	29	20	12.0	163	0.0	0.29	5.50	0.73	0.50	1.37	19
03AL	3	87	7	DRY	759	432	8.00	5120	8.9	50	8	1640	2070	420.0	118	30.0	10.00	100.00	61.82	2.00	2.06	24
03AU	3	87	7	DRY	758	431	3.60	2304	9.0	22	3	705	910	70.0	229	15.0	5.00	36.88	11.82	1.50	1.65	19
03BL	3	87	7	DRY	761	434	8.50	5440	9.1	31	5	1640	2300	225.0	136	32.0	9.60	100.00	50.91	0.00	1.92	23
03BU	3	87	7	DRY	760	433	4.00	2560	9.1	22	3	781	1060	53.0	193	17.0	3.70	48.00	14.09	2.00	2.47	19
04AL	3	87	7	DRY	755	428	0.32	205	8.4	53	5	12	20	17.0	156	0.0	0.43	4.88	0.42	1.00	0.55	20
04AU	3	87	7	DRY	754	427	0.28	179	8.4	49	4	16	12	13.0	153	0.0	0.38	3.94	0.42	0.00	0.82	19
04BL	3	87	7	DRY	757	430	0.28	179	8.5	47	4	8	12	13.0	131	0.0	0.44	5.25	0.42	1.00	0.27	13
04BU	3	87	7	DRY	756	429	0.30	192	8.4	48	4	9	12	18.0	143	0.0	0.34	5.38	0.42	0.50	0.55	13
05AL	3	87	7	DRY	747	420	0.64	410	8.8	25	4	140	30	4.0	261	5.0	10.00	11.88	2.00	1.50	1.92	11
05AU	3	87	7	DRY	746	419	0.60	384	8.6	32	5	105	30	20.0	276	0.0	5.10	15.31	1.42	2.00	1.92	21
05BL	3	87	7	DRY	749	422	0.60	384	9.0	22	4	137	24	2.0	281	10.0	13.80	7.06	1.67	1.00	1.37	9
0[illegible]	[illegible]	87	7	DRY	748	421	0.46	294	8.6	30	3	83	22	8.0	224	0.0	4.20	8.63	1.08	1.00	1.92	17
06[illegible]	[illegible]	87	7	DRY	751	424	0.32	205	8.5	31	2	57	22	16.0	183	0.0	0.46	3.75	0.25	0.00	0.55	3
06AU	3	87	7	DRY	750	423	0.30	192	8.3	36	3	39	18	17.0	153	2.0	0.46	4.94	0.25	0.00	0.55	6
06BL	3	87	7	DRY	753	426	0.28	179	8.6	31	2	46	16	12.0	166	2.0	0.38	3.63	0.33	0.00	0.00	1
06BU	3	87	7	DRY	752	425	0.26	166	8.3	43	3	24	16	13.0	156	0.0	0.29	3.88	0.42	2.00	0.27	4
07AL	3	87	7	DRY	899	572	0.64	410	9.0	24	4	124	46	42.0	209	5.0	3.60	19.38	1.75	2.27	4.66	11
07AU	3	87	7	DRY	898	571	0.56	358	8.7	29	6	83	38	30.0	191	0.0	2.80	20.63	1.50	3.64	3.84	12
07BL	3	87	7	DRY	901	574	1.20	768	9.1	22	3	284	146	123.0	188	7.0	4.60	26.25	2.92	1.82	2.47	6
07BU	3	87	7	DRY	900	573	0.96	614	9.0	21	3	242	88	68.0	206	7.0	4.40	30.94	2.75	3.64	3.29	8
08AL	3	87	7	DRY	795	468	1.90	1216	9.8	15	2	440	374	122.0	274	49.0	2.10	15.94	6.08	0.00	2.61	12
08AU	3	87	7	DRY	794	467	0.64	410	9.3	20	4	120	76	11.0	239	12.0	1.05	5.75	1.13	0.00	3.15	21
08BL	3	87	7	DRY	797	470	3.00	1920	9.3	23	3	600	666	263.0	206	10.0	1.60	19.69	8.33	0.63	2.61	19
08BU	3	87	7	DRY	796	469	1.70	1088	8.9	13	1	309	378	79.0	141	2.0	0.60	15.00	1.50	1.25	2.47	36
09AL	3	87	7	DRY	783	456	0.44	282	8.6	32	6	39	42	0.0	167	0.0	0.43	6.75	0.92	0.00	2.47	37
09AU	3	87	7	DRY	782	455	0.40	256	8.4	42	7	24	20	13.0	191	0.0	0.27	9.69	0.92	2.50	2.47	40
09BL	3	87	7	DRY	785	458	0.84	538	8.7	29	6	111	144	32.0	167	5.0	0.41	16.13	0.92	1.25	2.06	53
09BU	3	87	7	DRY	784	457	0.40	256	8.5	40	7	26	18	12.0	186	0.0	0.27	9.06	1.00	3.75	2.19	36
10AL	3	87	7	DRY	767	440	0.36	230	8.6	39	5	32	30	3.0	146	0.0	0.88	5.31	0.82	0.50	0.69	7
10AU	3	87	7	DRY	766	439	0.36	230	8.6	42	5	16	28	8.0	151	0.0	0.62	4.38	0.82	1.00	1.10	11
10BL	3	87	7	DRY	769	442	0.36	230	8.6	37	4	34	38	12.0	128	0.0	0.90	5.44	0.55	0.00	0.55	7
10BU	3	87	7	DRY	768	441	0.28	179	8.7	40	4	16	12	5.0	143	0.0	0.52	3.38	0.36	0.00	1.10	11
11AL	3	87	7	DRY	847	520	0.88	563	8.5	40	3	152	96	67.0	201	0.0	11.70	10.00	1.62	0.00	1.65	21
11AU	3	87	7	DRY	846	519	0.82	525	8.7	38	3	148	86	51.0	214	5.0	10.00	10.94	1.62	1.00	2.19	19
11BL	3	87	7	DRY	849	522	1.30	832	8.6	40	3	284	142	83.0	211	2.0	15.80	35.00	2.15	0.00	1.37	20
1[illegible]	[illegible]	87	7	DRY	848	521	1.26	806	8.5	45	3	253	164	75.0	183	2.0	10.50	26.88	2.00	0.00	1.92	20

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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
12AL	3	87	7	DRY	791	464	2.60	1664	8.5	65	8	440	480	213.0	194	0.0	9.60	62.50	4.50	1.88	3.02	67
12AU	3	87	7	DRY	790	463	3.20	2048	8.3	122	14	480	576	250.0	186	0.0	6.80	87.50	3.75	2.50	2.88	93
12BL	3	87	7	DRY	793	466	2.30	1472	8.5	57	7	377	408	186.0	176	0.0	9.00	56.25	3.75	1.25	2.74	65
12BU	3	87	7	DRY	792	465	2.80	1792	8.4	107	12	420	516	225.0	153	0.0	6.60	85.00	3.75	3.75	2.74	89
13AL	3	87	7	DRY	843	516	1.00	640	8.7	39	4	148	150	58.0	126	2.0	6.80	16.56	1.15	6.88	3.29	16
13AU	3	87	7	DRY	842	515	4.00	2560	8.5	156	17	667	940	193.0	116	0.0	4.20	120.00	1.85	46.43	3.02	48
13BL	3	87	7	DRY	845	518	1.20	768	8.6	54	6	211	206	61.0	121	0.0	5.80	26.25	1.38	2.50	3.57	17
13BU	3	87	7	DRY	844	517	2.80	1792	8.5	118	12	467	638	135.0	108	0.0	4.50	67.50	1.38	22.40	2.74	36
14AL	3	87	7	DRY	779	452	1.30	832	8.3	58	10	149	144	91.0	133	0.0	0.33	65.00	0.83	0.63	1.92	78
14AU	3	87	7	DRY	778	451	1.10	704	8.4	40	7	98	68	47.0	199	0.0	0.30	53.75	2.17	4.38	3.02	129
14BL	3	87	7	DRY	781	454	0.72	461	8.5	39	6	92	62	29.0	236	0.0	0.42	25.63	1.08	3.75	3.29	53
14BU	3	87	7	DRY	780	453	0.88	563	8.4	41	8	56	36	52.0	201	0.0	0.27	40.00	1.75	2.50	3.02	126
15AL	3	87	7	DRY	839	512	0.28	179	8.7	42	4	9	14	0.0	131	2.0	0.50	5.25	0.46	1.00	1.92	29
15AU	3	87	7	DRY	838	511	0.30	192	8.6	47	4	7	22	0.0	141	0.0	0.24	6.13	0.38	1.00	1.92	29
15BL	3	87	7	DRY	841	514	0.22	141	8.6	44	4	7	16	0.0	122	0.0	0.29	4.38	0.38	0.00	1.92	13
15BU	3	87	7	DRY	840	513	0.28	179	8.6	50	4	7	22	0.0	133	0.0	0.20	5.38	0.31	0.50	1.92	19
16AL	3	87	7	DRY	763	436	7.20	4608	9.3	30	4	1400	1570	238.0	187	49.0	1.80	187.50	38.18	1.00	3.02	62
16AU	3	87	7	DRY	762	435	3.20	2048	8.9	32	4	571	690	45.0	156	10.0	0.58	73.00	5.73	3.00	3.84	49
16BL	3	87	7	DRY	765	438	9.50	6080	9.4	32	6	2514	2090	460.0	181	74.0	3.40	275.00	52.73	0.00	2.19	[illegible]
16BU	3	87	7	DRY	764	437	4.80	3072	9.1	35	4	862	1080	116.0	141	15.0	0.59	125.00	14.55	0.00	[illegible]	[illegible]
17AL	3	87	7	DRY	875	548	0.60	384	8.7	71	12	11	12	0.0	186	0.0	0.16	39.38	2.15	2.00	6.31	[illegible]
17AU	3	87	7	DRY	874	547	0.56	358	8.6	80	12	11	12	0.0	199	0.0	0.21	33.50	2.08	4.00	12.07	67
17BL	3	87	7	DRY	877	550	0.96	614	8.7	77	15	16	16	0.0	246	0.0	0.16	45.63	2.23	4.00	7.13	131
17BU	3	87	7	DRY	876	549	1.10	704	8.5	127	27	14	14	7.0	246	0.0	0.18	77.50	2.62	6.13	20.57	139
18AL	3	87	7	DRY	915	588	0.26	166	8.6	46	4	17	20	0.0	153	0.0	0.44	5.31	0.33	0.45	1.10	3
18AU	3	87	7	DRY	914	587	0.24	154	8.7	43	3	13	16	0.0	141	0.0	0.33	5.44	0.33	0.45	1.37	8
18BL	3	87	7	DRY	917	590	0.24	154	8.7	44	3	18	18	0.0	136	0.0	0.52	4.88	0.50	0.45	0.82	2
18BU	3	87	7	DRY	916	589	0.24	154	8.6	45	4	17	18	0.0	138	0.0	0.33	4.88	0.17	1.82	1.65	6
19AL	3	87	7	DRY	911	584	0.32	205	9.0	28	4	17	18	0.0	178	5.0	0.82	5.38	0.83	0.91	1.65	64
19AU	3	87	7	DRY	910	583	0.32	205	8.7	41	5	13	22	0.0	176	0.0	0.37	7.13	0.33	2.27	1.92	38
19BL	3	87	7	DRY	913	586	0.44	282	9.0	28	4	26	32	0.0	182	5.0	0.74	9.38	0.58	0.91	1.92	80
19BU	3	87	7	DRY	912	585	0.34	218	8.8	35	4	16	20	0.0	186	0.0	0.31	6.88	0.92	3.18	2.74	51
20AL	3	87	7	DRY	739	412	0.58	371	9.1	24	5	123	20	5.0	281	15.0	6.80	8.00	2.50	2.00	3.84	24
20AU	3	87	7	DRY	738	411	0.48	307	8.5	34	5	53	28	44.0	113	0.0	2.15	8.69	0.83	1.50	3.57	44
20BL	3	87	7	DRY	741	414	0.68	435	9.2	34	13	150	22	49.0	407	27.0	11.00	4.63	2.58	0.50	3.02	27
20BU	3	87	7	DRY	740	413	0.44	282	8.7	26	4	72	28	19.0	201	5.0	3.30	5.75	0.83	0.50	3.57	44
21AL	3	87	7	DRY	891	564	0.82	525	9.6	27	28	222	62	0.0	357	46.0	0.64	4.06	1.08	1.50	1.65	28
21AU	3	87	7	DRY	890	563	0.36	230	8.9	25	7	68	22	8.0	186	10.0	0.29	3.88	0.38	1.50	2.19	19
21BL	3	87	7	DRY	893	566	0.80	512	9.5	45	34	211	72	2.0	397	47.0	0.62	5.25	0.38	0.00	1.37	37
21BU	3	87	7	DRY	892	565	0.38	243	8.6	27	5	56	30	12.0	177	2.0	0.21	5.00	0.54	1.00	2.47	25
22AL	3	87	7	DRY	887	560	0.24	154	8.5	38	3	12	18	10.0	117	0.0	0.34	3.63	0.54	0.00	0.82	6
22AU	3	87	7	DRY	886	559	0.22	141	8.5	39	3	7	16	0.0	126	0.0	0.22	3.44	0.85	0.00	0.82	9
22BL	3	87	7	DRY	889	562	0.20	128	8.5	36	3	9	20	0.0	112	0.0	0.32	3.00	0.38	0.00	0.55	3
22BU	3	87	7	DRY	888	561	0.22	141	8.4	37	3	7	16	1.0	113	0.0	0.23	3.25	0.85	0.00	[illegible]	[illegible]

Raw Soil Sample Data

For Quarter 3/87

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	87	7	DRY	859	532	0.82	525	8.9	35	3	157	64	32.0	279	8.0	12.00	5.38	1.31	3.50	1.37	9
23AU	3	87	7	DRY	858	531	0.80	512	8.8	39	4	150	64	9.0	299	5.0	12.20	7.63	1.46	4.50	2.19	10
23BL	3	87	7	DRY	861	534	0.76	486	8.9	45	3	147	68	45.0	271	5.0	12.20	6.88	1.00	2.50	2.19	9
23BU	3	87	7	DRY	860	533	0.74	474	8.8	39	3	147	54	4.0	289	5.0	10.00	10.00	1.54	5.00	1.92	9
24AL	3	87	7	DRY	907	580	1.20	768	9.0	27	3	253	92	122.0	131	2.0	5.00	43.13	1.67	0.91	1.92	23
24AU	3	87	7	DRY	906	579	1.26	806	8.9	36	4	263	122	76.0	151	0.0	3.70	32.50	1.75	0.91	1.92	35
24BL	3	87	7	DRY	909	582	1.10	704	8.8	29	3	242	114	74.0	156	2.0	5.80	47.50	1.25	0.91	1.10	17
24BU	3	87	7	DRY	908	581	1.20	768	8.7	39	5	232	116	50.0	151	0.0	4.20	61.25	1.67	2.27	1.92	32
25AL	3	87	7	DRY	827	500	1.50	960	8.4	73	12	227	102	200.0	126	0.0	1.40	52.50	1.54	0.00	4.11	23
25AU	3	87	7	DRY	826	499	3.00	1920	8.1	273	42	357	300	391.0	96	0.0	0.94	200.00	1.46	0.71	3.02	38
25BL	3	87	7	DRY	829	502	1.40	896	8.4	79	13	216	154	116.0	111	0.0	1.50	60.00	1.46	0.00	2.19	22
25BU	3	87	7	DRY	828	501	2.60	1664	8.2	191	29	292	252	177.0	88	0.0	1.10	150.00	1.38	0.00	2.47	32
26AL	3	87	7	DRY	903	576	0.28	179	8.7	38	3	32	24	0.0	126	0.0	0.66	5.38	0.58	0.91	1.10	3
26AU	3	87	7	DRY	902	575	0.28	179	8.6	44	3	13	22	0.0	128	0.0	0.32	5.75	0.67	1.36	1.37	6
26BL	3	87	7	DRY	905	578	0.24	154	8.8	36	3	21	24	0.0	123	0.0	0.36	4.56	0.67	0.91	0.82	2
26BU	3	87	7	DRY	904	577	0.22	141	8.7	40	3	15	14	0.0	126	0.0	0.26	4.50	0.17	1.36	0.82	5
27AL	3	87	7	DRY	743	416	1.10	704	9.4	26	7	282	128	0.0	342	30.0	14.20	14.38	4.00	1.00	1.92	13
27AU	3	87	7	DRY	742	415	0.76	486	8.8	26	4	160	27	24.0	358	0.0	5.20	17.81	2.08	3.00	3.29	19
27BL	3	87	7	DRY	745	418	0.88	563	9.3	33	15	212	28	45.0	417	44.0	19.50	7.50	2.50	0.00	1.37	16
[illegible]	[illegible]	87	7	DRY	744	417	0.56	358	8.8	23	4	133	16	2.0	289	15.0	6.30	9.69	1.83	2.00	1.65	13
2[illegible]	[illegible]	87	7	DRY	871	544	0.56	358	9.1	29	3	120	28	49.0	226	7.0	2.18	9.38	1.77	1.00	1.10	9
28AU	3	87	7	DRY	870	543	0.56	358	9.1	32	3	107	26	23.0	226	12.0	2.20	12.19	1.85	1.00	1.10	10
28BL	3	87	7	DRY	873	546	0.52	333	9.1	28	3	113	36	16.0	241	6.0	2.20	11.75	1.62	1.00	1.37	9
28BU	3	87	7	DRY	872	545	0.50	320	9.1	27	3	107	24	0.0	246	10.0	2.35	15.00	1.46	2.50	1.37	9
30AL	3	87	7	DRY	863	536	3.60	2304	8.5	102	15	716	656	545.0	171	0.0	4.60	47.50	4.77	2.00	1.10	31
30AU	3	87	7	DRY	862	535	1.40	896	8.9	47	3	346	178	167.0	302	5.0	9.00	10.13	3.15	2.00	1.65	13
30BL	3	87	7	DRY	865	538	4.20	2688	8.4	148	21	800	740	691.0	168	0.0	4.20	62.25	5.00	0.00	1.37	34
30BU	3	87	7	DRY	864	537	1.90	1216	8.9	48	4	400	236	282.0	297	12.0	7.80	15.63	4.23	2.00	1.65	16
31AL	3	87	7	DRY	855	528	0.96	614	9.2	24	2	221	104	70.0	216	12.0	9.80	10.94	2.00	0.00	1.37	7
31AU	3	87	7	DRY	854	527	1.30	832	9.1	29	3	284	166	111.0	226	10.0	7.00	24.88	2.38	0.00	1.37	10
31BL	3	87	7	DRY	857	530	1.30	832	9.2	25	2	295	194	90.0	236	10.0	10.00	8.94	2.46	0.00	1.65	7
31BU	3	87	7	DRY	856	529	2.60	1664	8.9	33	3	533	520	218.0	173	7.0	6.60	30.63	2.92	0.00	1.92	14
32AL	3	87	7	DRY	851	524	1.90	1216	9.3	25	2	389	308	141.0	246	20.0	8.80	31.25	3.08	1.00	2.19	7
32AU	3	87	7	DRY	850	523	1.70	1088	9.3	26	5	368	272	0.0	312	20.0	8.40	38.13	2.92	5.00	2.47	10
32BL	3	87	7	DRY	853	526	1.60	1024	9.3	28	7	347	214	93.0	317	20.0	9.00	30.00	3.77	1.00	3.02	13
32BU	3	87	7	DRY	852	525	1.60	1024	9.4	23	4	347	212	69.0	311	21.0	7.80	32.50	3.69	2.50	3.57	10
33AL	3	87	7	DRY	799	472	0.20	128	8.6	35	3	8	22	0.0	96	0.0	0.20	2.25	0.17	2.00	4.66	11
33AU	3	87	7	DRY	798	471	0.20	128	8.5	34	3	7	22	0.0	88	0.0	0.19	2.50	0.17	1.00	5.21	12
33BL	3	87	7	DRY	801	474	0.20	128	8.6	33	3	8	20	0.0	96	0.0	0.18	2.44	0.17	0.00	4.11	12
33BU	3	87	7	DRY	800	473	0.18	115	8.6	33	3	8	18	-1.0	93	0.0	0.16	2.31	0.25	1.00	6.03	14
34AL	3	87	7	DRY	819	492	0.24	154	8.6	43	3	11	20	4.0	113	0.0	0.20	3.75	0.15	1.07	0.55	5
34AU	3	87	7	DRY	818	491	0.24	154	8.6	43	3	8	16	0.0	118	0.0	0.20	3.88	0.23	0.00	1.10	6
34BL	3	87	7	DRY	821	494	0.24	154	8.6	41	3	16	16	1.0	116	0.0	0.23	3.75	0.23	0.71	0.55	6
3[illegible]	[illegible]	87	7	DRY	820	493	0.24	154	8.5	45	4	8	12	0.0	131	0.0	0.19	3.75	0.15	1.43	1.37	8

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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	3	87	7	DRY	823	496	0.18	115	8.4	37	3	6	16	1.0	98	0.0	0.19	2.88	0.23	0.00	3.29	6
35AU	3	87	7	DRY	822	495	0.18	115	8.3	34	2	5	12	0.0	96	0.0	0.13	2.63	0.31	0.00	4.94	9
35BL	3	87	7	DRY	825	498	0.18	115	8.5	38	3	6	14	0.0	97	0.0	0.15	3.56	0.31	0.00	4.11	9
35BU	3	87	7	DRY	824	497	0.20	128	8.3	40	3	8	14	0.0	103	0.0	0.10	3.38	0.23	0.00	5.76	14
36AL	3	87	7	DRY	879	552	0.92	589	8.4	78	6	97	112	120.0	102	0.0	0.54	21.88	2.00	1.00	0.55	7
36AU	3	87	7	DRY	878	551	0.46	294	8.6	46	4	34	58	17.0	121	0.0	0.25	10.31	0.92	2.50	1.10	10
36BL	3	87	7	DRY	881	554	2.00	1280	8.3	149	12	256	360	35.0	85	0.0	0.26	91.25	0.69	0.00	0.55	10
36BU	3	87	7	DRY	880	553	0.84	538	8.4	73	6	70	140	12.0	90	0.0	0.17	33.75	0.54	1.00	0.82	12
37AL	3	87	7	DRY	883	556	0.26	166	8.6	50	3	10	12	0.0	151	0.0	0.33	4.44	0.62	0.00	1.10	3
37AU	3	87	7	DRY	882	555	0.24	154	8.6	48	3	9	16	0.0	156	0.0	0.24	4.38	0.46	0.00	1.65	6
37BL	3	87	7	DRY	885	558	0.24	154	8.4	49	3	10	14	0.0	153	0.0	0.23	3.63	0.92	0.00	1.10	4
37BU	3	87	7	DRY	884	557	0.24	154	8.4	50	3	8	14	0.0	157	0.0	0.21	3.81	0.69	0.00	1.37	6
38AL	3	87	7	DRY	919	592	0.92	589	9.7	13	3	238	92	38.0	302	47.0	0.38	9.06	1.71	1.00	2.19	2
38AU	3	87	7	DRY	918	591	0.48	307	9.3	13	3	105	36	0.0	213	21.0	0.44	6.44	0.93	1.50	1.92	3
38BL	3	87	7	DRY	921	594	1.10	704	9.7	12	3	292	116	38.0	341	66.0	1.20	10.63	3.50	1.00	1.65	2
38BU	3	87	7	DRY	920	593	0.44	282	9.3	13	3	105	26	0.0	224	27.0	0.36	5.50	0.79	3.00	2.47	3
39AL	3	87	7	DRY	923	596	0.94	602	9.1	16	3	227	164	46.0	161	17.0	0.37	9.50	1.64	15.63	1.37	5
39AU	3	87	7	DRY	922	595	0.62	397	8.9	23	3	105	98	28.0	141	5.0	0.23	10.81	0.71	25.00	1.65	9
39BL	3	87	7	DRY	925	598	5.00	3200	8.6	96	15	1015	1560	163.0	98	0.0	0.68	41.88	4.29	0.00	1.65	11
39BU	3	87	7	DRY	924	597	2.40	1536	8.8	38	4	460	650	37.0	121	2.0	0.23	17.81	1.50	1.00	[illegible]	[illegible]
40AL	3	87	7	DRY	831	504	0.44	282	8.6	54	4	34	40	50.0	128	0.0	0.20	6.25	0.85	0.00	[illegible]	[illegible]
40AU	3	87	7	DRY	830	503	0.70	448	8.5	85	7	40	48	124.0	126	0.0	0.70	13.12	0.77	0.00	1.92	26
40BL	3	87	7	DRY	833	506	0.44	282	8.7	53	5	30	40	50.0	126	0.0	0.17	8.13	0.31	0.00	1.65	14
40BU	3	87	7	DRY	832	505	0.76	486	8.5	88	7	55	52	160.0	129	0.0	0.10	13.63	0.62	0.00	1.65	25
41AL	3	87	7	DRY	895	568	1.60	1024	8.4	37	5	311	390	47.0	143	0.0	0.35	14.25	2.38	0.00	0.27	12
41AU	3	87	7	DRY	894	567	0.84	538	8.3	60	7	78	161	34.0	128	0.0	0.13	8.63	0.46	1.00	0.55	18
41BL	3	87	7	DRY	897	570	4.60	2944	8.6	39	4	933	1320	220.0	133	10.0	0.70	41.25	7.54	0.00	0.00	13
41BU	3	87	7	DRY	896	569	2.20	1408	8.2	91	9	333	540	88.0	116	0.0	0.18	25.00	1.38	5.00	0.55	21
42AL	3	87	7	DRY	807	480	0.32	205	8.5	57	4	18	30	24.0	136	0.0	0.23	4.38	0.67	1.50	1.37	8
42AU	3	87	7	DRY	806	479	0.32	205	8.4	51	4	22	28	3.0	70	0.0	0.28	4.13	0.50	0.00	0.82	6
42BL	3	87	7	DRY	809	482	0.24	154	8.7	44	3	17	18	0.0	123	0.0	0.29	3.19	0.58	0.00	0.27	2
42BU	3	87	7	DRY	808	481	0.34	218	8.5	57	4	18	32	22.0	141	0.0	0.15	4.25	0.67	0.50	1.10	11
43AL	3	87	7	DRY	803	476	1.90	1216	8.8	52	13	358	352	221.0	204	5.0	0.56	5.75	2.75	1.00	3.84	18
43AU	3	87	7	DRY	802	475	1.50	960	8.7	54	13	305	248	165.0	244	0.0	0.80	12.50	1.92	1.50	4.11	14
43BL	3	87	7	DRY	805	478	2.00	1280	8.8	56	15	358	388	245.0	183	0.0	0.40	5.13	2.17	1.00	3.84	22
43BU	3	87	7	DRY	804	477	1.40	896	8.5	50	12	263	254	143.0	166	5.0	0.86	10.31	2.42	1.00	3.57	15
44AL	3	87	7	DRY	787	460	0.86	550	9.1	23	4	120	116	0.0	191	10.0	0.35	14.69	1.92	1.25	3.84	78
44AU	3	87	7	DRY	786	459	0.46	294	8.7	28	5	32	22	8.0	214	2.0	0.19	9.88	1.17	1.25	4.11	78
44BL	3	87	7	DRY	789	462	1.50	960	9.1	22	4	263	256	33.0	224	10.0	0.34	37.50	3.92	1.25	2.74	109
44BU	3	87	7	DRY	788	461	0.60	384	8.7	31	5	38	46	21.0	201	2.0	0.18	17.19	1.42	7.34	3.57	96
45AL	3	87	7	DRY	867	540	1.80	1152	9.3	24	2	421	200	300.0	271	25.0	9.80	9.38	4.69	2.00	0.27	4
45AU	3	87	7	DRY	866	539	1.30	832	9.5	22	2	324	128	113.0	294	30.0	13.20	14.38	3.08	2.00	0.55	4
45BL	3	87	7	DRY	869	542	3.20	2048	9.0	30	3	716	488	588.0	226	22.0	9.20	12.63	6.46	4.00	0.27	7
45BU	3	87	7	DRY	868	541	1.70	1088	9.3	22	2	378	230	120.0	319	25.0	11.50	20.13	3.77	5.75	0.55	4

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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	3	87	7	DRY	775	448	0.99	0.60	28.57	1.42	9999.99
01AU	3	87	7	DRY	774	447	0.70	0.76	35.18	1.85	9999.99
01BL	3	87	7	DRY	777	450	2.03	0.60	38.42	1.79	9999.99
01BU	3	87	7	DRY	776	449	1.27	0.78	36.55	1.95	9999.99
02AL	3	87	7	DRY	771	444	2.85	1.34	28.94	3.04	9999.99
02AU	3	87	7	DRY	770	443	0.77	1.57	30.56	3.23	9999.99
02BL	3	87	7	DRY	773	446	1.96	0.91	28.44	2.86	9999.99
02BU	3	87	7	DRY	772	445	0.60	1.31	29.19	2.88	9999.99
03AL	3	87	7	DRY	759	432	11.47	1.02	22.41	1.81	9999.99
03AU	3	87	7	DRY	758	431	7.49	1.28	24.16	2.01	9999.99
03BL	3	87	7	DRY	761	434	12.65	1.05	19.77	1.79	9999.99
03BU	3	87	7	DRY	760	433	9.10	1.39	24.96	2.12	9999.99
04AL	3	87	7	DRY	755	428	0.33	0.95	32.93	1.38	9999.99
04AU	3	87	7	DRY	754	427	0.36	1.11	30.31	1.60	9999.99
04BL	3	87	7	DRY	757	430	0.28	0.76	32.19	1.27	9999.99
04BU	3	87	7	DRY	756	429	0.33	0.93	34.18	1.58	9999.99
05AL	3	87	7	DRY	747	420	2.14	0.83	23.59	1.71	9999.99
05AU	3	87	7	DRY	746	419	1.24	0.93	24.19	1.81	9999.99
05BL	3	87	7	DRY	749	422	2.34	0.59	25.29	1.64	9999.99
05BU	3	87	7	DRY	748	421	1.19	0.95	25.20	1.95	9999.99
06AL	3	87	7	DRY	751	424	1.01	0.32	34.31	1.46	9999.99
06AU	3	87	7	DRY	750	423	0.74	0.47	35.80	1.64	9999.99
06BL	3	87	7	DRY	753	426	0.87	0.27	34.93	1.36	9999.99
06BU	3	87	7	DRY	752	425	0.56	0.47	33.06	1.56	9999.99
07AL	3	87	7	DRY	899	572	1.51	0.49	23.75	3.02	9999.99
07AU	3	87	7	DRY	898	571	1.05	0.56	24.08	3.12	9999.99
07BL	3	87	7	DRY	901	574	3.32	0.54	24.65	3.37	9999.99
07BU	3	87	7	DRY	900	573	2.69	0.59	24.08	3.27	9999.99
08AL	3	87	7	DRY	795	468	5.22	0.72	18.92	1.15	9999.99
08AU	3	87	7	DRY	794	467	1.45	0.97	21.52	1.71	9999.99
08BL	3	87	7	DRY	797	470	5.22	0.51	17.91	1.13	9999.99
08BU	3	87	7	DRY	796	469	2.24	0.92	21.29	1.50	9999.99
09AL	3	87	7	DRY	783	456	0.65	1.54	22.87	2.38	9999.99
09AU	3	87	7	DRY	782	455	0.50	1.76	24.20	2.75	9999.99
09BL	3	87	7	DRY	785	458	1.45	2.56	13.32	2.92	9999.99
09BU	3	87	7	DRY	784	457	0.52	1.61	24.87	2.90	9999.99
10AL	3	87	7	DRY	767	440	0.60	0.58	28.82	1.91	9999.99
10AU	3	87	7	DRY	766	439	0.46	0.58	23.94	1.48	9999.99
10BL	3	87	7	DRY	769	442	0.53	0.51	27.82	1.71	9999.99
10BU	3	87	7	DRY	768	441	0.36	0.56	24.83	1.54	9999.99
11AL	3	87	7	DRY	847	520	2.74	2.01	31.94	1.89	9999.99
11AU	3	87	7	DRY	846	519	2.81	1.90	30.94	1.77	9999.99
11BL	3	87	7	DRY	849	522	3.28	1.68	32.06	1.85	9999.99
11BU	3	87	7	DRY	848	521	3.21	1.94	31.56	1.81	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	3	87	7	DRY	791	464	4.97	2.76	24.93	2.06	9999.99
12AU	3	87	7	DRY	790	463	4.47	2.76	24.70	1.93	9999.99
12BL	3	87	7	DRY	793	466	3.98	2.56	23.75	1.73	9999.99
12BU	3	87	7	DRY	792	465	4.23	2.76	24.81	1.93	9999.99
13AL	3	87	7	DRY	843	516	1.87	0.95	27.94	1.93	9999.99
13AU	3	87	7	DRY	842	515	4.72	1.09	25.04	1.81	9999.99
13BL	3	87	7	DRY	845	518	1.94	0.85	27.57	1.87	9999.99
13BU	3	87	7	DRY	844	517	3.48	1.02	27.57	1.87	9999.99
14AL	3	87	7	DRY	779	452	1.62	3.15	23.78	2.40	9999.99
14AU	3	87	7	DRY	778	451	1.08	4.33	22.41	2.71	9999.99
14BL	3	87	7	DRY	781	454	1.24	2.95	25.44	2.94	9999.99
14BU	3	87	7	DRY	780	453	0.75	4.92	24.60	3.41	9999.99
15AL	3	87	7	DRY	839	512	0.35	1.28	27.44	1.25	9999.99
15AU	3	87	7	DRY	838	511	0.35	1.41	28.57	1.23	9999.99
15BL	3	87	7	DRY	841	514	0.35	0.78	28.69	1.23	9999.99
15BU	3	87	7	DRY	840	513	0.35	1.02	30.56	1.32	9999.99
16AL	3	87	7	DRY	763	436	14.24	1.48	23.75	2.06	9999.99
16AU	3	87	7	DRY	762	435	4.59	1.22	23.03	1.60	9999.99
16BL	3	87	7	DRY	765	438	15.42	2.36	24.46	2.65	9999.99
16BU	3	87	7	DRY	764	437	7.25	1.54	24.16	1.95	9999.99
17AL	3	87	7	DRY	875	548	0.50	4.92	33.06	4.25	9999.99
17AU	3	87	7	DRY	874	547	0.37	3.28	33.93	4.13	9999.99
17BL	3	87	7	DRY	877	550	0.42	6.14	33.93	4.85	9999.99
17BU	3	87	7	DRY	876	549	0.37	4.51	35.18	5.49	9999.99
18AL	3	87	7	DRY	915	588	0.44	0.59	31.06	1.75	9999.99
18AU	3	87	7	DRY	914	587	0.36	0.78	25.75	1.40	9999.99
18BL	3	87	7	DRY	917	590	0.44	0.49	27.69	1.69	9999.99
18BU	3	87	7	DRY	916	589	0.34	0.73	27.57	1.58	9999.99
19AL	3	87	7	DRY	911	584	0.46	4.17	24.65	2.12	9999.99
19AU	3	87	7	DRY	910	583	0.48	2.84	24.79	1.99	9999.99
19BL	3	87	7	DRY	913	586	0.58	4.74	24.34	2.30	9999.99
19BU	3	87	7	DRY	912	585	0.48	3.60	24.59	1.97	9999.99
20AL	3	87	7	DRY	739	412	1.81	1.28	23.18	2.01	9999.99
20AU	3	87	7	DRY	738	411	0.74	1.22	21.97	1.85	9999.99
20BL	3	87	7	DRY	741	414	2.83	1.72	24.39	2.40	9999.99
20BU	3	87	7	DRY	740	413	0.96	1.48	23.19	2.06	9999.99
21AL	3	87	7	DRY	891	564	3.48	1.48	23.44	1.97	9999.99
21AU	3	87	7	DRY	890	563	0.87	1.08	25.25	2.18	9999.99
21BL	3	87	7	DRY	893	566	2.85	1.31	24.01	1.89	9999.99
21BU	3	87	7	DRY	892	565	0.68	1.19	25.40	2.22	9999.99
22AL	3	87	7	DRY	887	560	0.31	0.42	25.56	0.86	9999.99
22AU	3	87	7	DRY	886	559	0.28	0.54	25.87	0.99	9999.99
22BL	3	87	7	DRY	889	562	0.28	0.30	25.36	0.80	9999.99
22BU	3	87	7	DRY	888	561	0.24	0.38	24.97	0.82	9999.99

Raw Soil Sample Data

For Quarter 3/87

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	3	87	7	DRY	859	532	3.48	1.51	33.68	2.22	9999.99
23AU	3	87	7	DRY	858	531	3.33	1.60	35.55	2.49	9999.99
23BL	3	87	7	DRY	861	534	3.41	1.51	32.81	2.18	9999.99
23BU	3	87	7	DRY	860	533	3.26	1.39	34.56	2.59	9999.99
24AL	3	87	7	DRY	907	580	2.85	1.87	24.85	2.03	9999.99
24AU	3	87	7	DRY	906	579	2.69	2.28	25.20	2.08	9999.99
24BL	3	87	7	DRY	909	582	2.69	1.57	26.70	2.10	9999.99
24BU	3	87	7	DRY	908	581	2.69	2.47	25.44	2.18	9999.99
25AL	3	87	7	DRY	827	500	2.54	1.74	26.95	3.08	9999.99
25AU	3	87	7	DRY	826	499	3.16	1.45	30.06	3.16	9999.99
25BL	3	87	7	DRY	829	502	2.41	1.71	30.06	3.06	9999.99
25BU	3	87	7	DRY	828	501	2.77	1.54	29.32	3.04	9999.99
26AL	3	87	7	DRY	903	576	0.63	0.34	27.44	1.32	9999.99
26AU	3	87	7	DRY	902	575	0.39	0.51	24.50	1.13	9999.99
26BL	3	87	7	DRY	905	578	0.53	0.34	27.07	1.25	9999.99
26BU	3	87	7	DRY	904	577	0.36	0.47	25.32	1.19	9999.99
27AL	3	87	7	DRY	743	416	4.61	0.90	23.98	1.19	9999.99
27AU	3	87	7	DRY	742	415	2.54	1.25	24.66	1.50	9999.99
27BL	3	87	7	DRY	745	418	5.12	0.68	23.59	1.17	9999.99
27BU	3	87	7	DRY	744	417	2.01	0.90	23.64	1.32	9999.99
28AL	3	87	7	DRY	871	544	3.19	1.31	30.69	2.08	9999.99
28AU	3	87	7	DRY	870	543	2.97	1.39	28.44	1.89	9999.99
28BL	3	87	7	DRY	873	546	2.97	1.31	37.05	1.87	9999.99
28BU	3	87	7	DRY	872	545	3.04	1.37	32.81	1.95	9999.99
30AL	3	87	7	DRY	863	536	7.71	2.46	39.42	3.86	9999.99
30AU	3	87	7	DRY	862	535	6.21	1.92	36.80	3.39	9999.99
30BL	3	87	7	DRY	865	538	7.46	2.25	41.92	3.99	9999.99
30BU	3	87	7	DRY	864	537	7.21	2.25	42.04	4.11	9999.99
31AL	3	87	7	DRY	855	528	2.41	0.46	24.43	1.05	9999.99
31AU	3	87	7	DRY	854	527	2.88	0.54	24.30	1.11	9999.99
31BL	3	87	7	DRY	857	530	2.94	0.42	23.80	1.05	9999.99
31BU	3	87	7	DRY	856	529	4.47	0.49	24.00	1.05	9999.99
32AL	3	87	7	DRY	851	524	4.47	0.35	22.79	1.11	9999.99
32AU	3	87	7	DRY	850	523	3.48	0.42	21.98	1.13	9999.99
32BL	3	87	7	DRY	853	526	4.23	0.41	23.23	1.25	9999.99
32BU	3	87	7	DRY	852	525	3.98	0.42	22.80	1.25	9999.99
33AL	3	87	7	DRY	799	472	0.27	0.23	6.96	0.45	9999.99
33AU	3	87	7	DRY	798	471	0.22	0.27	7.00	0.49	9999.99
33BL	3	87	7	DRY	801	474	0.29	0.28	8.60	0.51	9999.99
33BU	3	87	7	DRY	800	473	0.29	0.30	6.91	0.47	9999.99
34AL	3	87	7	DRY	819	492	0.32	0.39	28.57	1.03	9999.99
34AU	3	87	7	DRY	818	491	0.32	0.54	29.94	1.19	9999.99
34BL	3	87	7	DRY	821	494	0.35	0.41	28.57	1.03	9999.99
34BU	3	87	7	DRY	820	493	0.30	0.49	27.32	0.97	9999.99

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Raw Soil Sample Data

For Quarter 3/87

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	87	7	DRY	823	496	0.22	0.26	15.92	0.64	9999.99
35AU	3	87	7	DRY	822	495	0.22	0.32	13.57	0.51	9999.99
35BL	3	87	7	DRY	825	498	0.25	0.30	14.31	0.62	9999.99
35BU	3	87	7	DRY	824	497	0.20	0.33	12.99	0.51	9999.99
36AL	3	87	7	DRY	879	552	1.11	0.68	32.06	1.95	9999.99
36AU	3	87	7	DRY	878	551	0.68	1.11	36.05	2.55	9999.99
36BL	3	87	7	DRY	881	554	1.94	0.63	32.93	2.10	9999.99
36BU	3	87	7	DRY	880	553	1.16	1.22	37.18	2.88	9999.99
37AL	3	87	7	DRY	883	556	0.31	0.40	30.31	1.11	9999.99
37AU	3	87	7	DRY	882	555	0.28	0.49	29.07	1.07	9999.99
37BL	3	87	7	DRY	885	558	0.31	0.44	31.31	1.13	9999.99
37BU	3	87	7	DRY	884	557	0.28	0.49	27.94	1.13	9999.99
38AL	3	87	7	DRY	919	592	7.73	0.39	32.81	2.82	9999.99
38AU	3	87	7	DRY	918	591	4.35	0.54	38.42	3.21	9999.99
38BL	3	87	7	DRY	921	594	12.08	0.39	32.43	2.51	9999.99
38BU	3	87	7	DRY	920	593	4.59	0.56	29.32	2.28	9999.99
39AL	3	87	7	DRY	923	596	4.11	0.51	31.44	3.06	9999.99
39AU	3	87	7	DRY	922	595	1.81	0.68	33.31	2.59	9999.99
39BL	3	87	7	DRY	925	598	8.22	0.39	30.81	2.98	9999.99
39BU	3	87	7	DRY	924	597	6.04	0.63	33.93	2.34	9999.99
40AL	3	87	7	DRY	831	504	0.75	1.20	28.69	1.75	9999.99
40AU	3	87	7	DRY	830	503	0.75	1.51	29.07	1.73	9999.99
40BL	3	87	7	DRY	833	506	0.75	1.33	27.57	1.85	9999.99
40BU	3	87	7	DRY	832	505	0.96	1.67	30.31	1.77	9999.99
41AL	3	87	7	DRY	895	568	2.48	0.54	25.69	1.52	9999.99
41AU	3	87	7	DRY	894	567	0.82	0.85	28.44	1.83	9999.99
41BL	3	87	7	DRY	897	570	7.05	0.51	25.30	1.27	9999.99
41BU	3	87	7	DRY	896	569	2.61	0.73	27.44	1.52	9999.99
42AL	3	87	7	DRY	807	480	0.41	0.54	34.31	1.29	9999.99
42AU	3	87	7	DRY	806	479	0.41	0.36	31.81	1.13	9999.99
42BL	3	87	7	DRY	809	482	0.41	0.19	33.31	0.97	9999.99
42BU	3	87	7	DRY	808	481	0.39	0.54	33.18	1.17	9999.99
43AL	3	87	7	DRY	803	476	3.48	1.10	30.69	3.99	9999.99
43AU	3	87	7	DRY	802	475	2.93	0.95	30.69	3.99	9999.99
43BL	3	87	7	DRY	805	478	3.48	1.13	30.19	3.95	9999.99
43BU	3	87	7	DRY	804	477	3.01	1.05	28.94	3.78	9999.99
44AL	3	87	7	DRY	787	460	3.23	7.17	23.68	2.94	9999.99
44AU	3	87	7	DRY	786	459	0.80	5.63	23.44	2.53	9999.99
44BL	3	87	7	DRY	789	462	4.23	7.68	23.52	2.98	9999.99
44BU	3	87	7	DRY	788	461	0.77	5.12	25.42	2.92	9999.99
45AL	3	87	7	DRY	867	540	6.96	0.56	33.56	1.83	9999.99
45AU	3	87	7	DRY	866	539	6.21	0.67	33.43	2.16	9999.99
45BL	3	87	7	DRY	869	542	8.45	0.77	27.57	2.24	9999.99
45BU	3	87	7	DRY	868	541	7.46	0.79	28.19	2.32	9999.99

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Raw Soil Sample Data

For Quarter 4/87

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	87	11	POST	971	947	1.10	704	8.7	21	5	238	120	106.0	226	0.0	2.10	26.25	2.00	2.50	4.23	10
07AU	4	87	11	POST	970	946	0.78	499	8.8	18	4	142	44	55.0	244	10.0	2.90	19.38	2.20	3.33	4.23	10
07BL	4	87	11	POST	973	949	1.10	704	9.2	14	2	270	65	100.0	352	20.0	4.60	17.50	2.20	2.92	3.93	6
07BU	4	87	11	POST	972	948	0.60	384	9.0	13	3	124	17	24.0	308	7.0	3.50	6.25	2.00	2.50	4.08	9
11AL	4	87	11	POST	987	963	1.30	832	8.4	38	4	259	154	125.0	284	0.0	11.50	19.38	1.60	3.33	0.91	22
11AU	4	87	11	POST	986	962	1.40	896	8.4	38	4	281	164	169.0	297	0.0	7.60	18.75	1.70	2.08	1.06	22
11BL	4	87	11	POST	989	965	1.60	1024	8.3	42	5	335	280	169.0	224	0.0	13.00	25.00	2.10	2.92	1.06	24
11BU	4	87	11	POST	988	964	1.50	960	8.5	35	3	292	198	144.0	261	0.0	9.80	20.63	1.90	2.50	0.91	19
12AL	4	87	11	POST	979	955	3.00	1920	8.0	168	19	378	662	106.0	153	0.0	5.40	60.00	1.60	5.00	1.81	86
12AU	4	87	11	POST	978	954	1.20	768	8.6	37	4	292	110	144.0	312	0.0	8.00	26.25	2.90	2.50	3.63	51
12BL	4	87	11	POST	981	957	3.20	2048	8.0	167	19	421	668	167.0	152	0.0	5.20	65.00	1.90	7.50	2.87	92
12BU	4	87	11	POST	980	956	1.40	896	8.6	40	4	270	124	194.0	281	0.0	8.00	31.25	3.80	4.17	3.02	55
13AL	4	87	11	POST	983	959	0.60	384	8.7	21	3	113	32	36.0	251	2.0	14.50	4.75	0.75	2.08	1.66	10
13AU	4	87	11	POST	982	958	0.62	397	8.8	31	12	113	32	13.0	297	5.0	8.60	5.00	1.05	3.33	2.12	15
13BL	4	87	11	POST	985	961	0.66	422	8.6	21	3	120	32	60.0	251	0.0	13.00	5.00	0.90	2.50	1.51	13
13BU	4	87	11	POST	984	960	0.62	397	8.7	28	10	120	26	25.0	287	10.0	8.70	5.25	0.90	3.33	1.51	15
23AL	4	87	11	POST	931	907	0.64	410	8.7	36	5	138	66	27.0	295	8.0	11.50	6.44	1.23	2.14	2.42	6
23AU	4	87	11	POST	930	906	0.64	410	8.7	26	6	124	42	24.0	251	14.0	11.00	8.00	1.15	2.86	2.12	8
23BL	4	87	11	POST	933	909	0.62	397	8.7	30	4	120	47	8.0	282	8.0	12.00	8.69	1.00	2.86	2.12	6
[illegible]	[illegible]	87	11	POST	932	908	0.60	384	8.7	39	4	124	34	3.0	282	8.0	10.00	7.81	1.38	2.50	2.42	6
[illegible]	4	87	11	POST	975	951	0.66	422	8.8	18	3	127	21	52.0	271	5.0	7.80	8.13	1.05	2.50	1.21	10
24AU	4	87	11	POST	974	950	0.40	256	8.7	19	4	72	18	23.0	229	0.0	4.00	6.56	0.80	1.67	1.81	19
24BL	4	87	11	POST	977	953	0.48	307	8.7	23	5	117	24	44.0	256	2.0	7.90	8.13	0.85	2.50	1.66	12
24BU	4	87	11	POST	976	952	0.50	320	8.7	22	4	80	16	14.0	256	0.0	4.20	5.63	0.55	2.92	2.12	22
25AL	4	87	11	POST	951	927	0.64	410	8.2	52	10	68	52	92.0	151	0.0	2.40	20.00	0.44	0.00	2.12	12
25AU	4	87	11	POST	950	926	1.20	768	8.2	78	16	135	86	245.0	126	0.0	1.70	40.00	0.89	0.00	2.27	18
25BL	4	87	11	POST	953	929	1.70	1088	8.2	117	21	267	224	264.0	113	0.0	1.90	65.00	1.48	0.00	2.27	19
25BU	4	87	11	POST	952	928	0.84	538	8.5	45	8	124	38	245.0	176	0.0	2.30	14.38	1.04	0.00	2.72	15
28AL	4	87	11	POST	939	915	0.54	346	8.9	41	7	156	22	33.0	204	5.0	1.68	18.75	1.77	0.71	2.72	17
28AU	4	87	11	POST	938	914	0.50	320	8.8	23	3	102	26	14.0	214	2.0	1.85	17.81	1.46	1.43	2.42	9
28BL	4	87	11	POST	941	917	0.56	358	9.0	22	3	114	28	60.0	216	7.0	1.80	9.06	2.00	1.43	2.42	5
28BU	4	87	11	POST	940	916	0.44	282	8.9	58	18	89	22	9.0	246	5.0	1.80	11.88	1.38	2.86	2.72	11
30AL	4	87	11	POST	927	903	3.70	2368	8.5	70	13	720	668	696.0	191	0.0	4.70	14.69	5.69	1.43	1.51	25
30AU	4	87	11	POST	926	902	1.34	858	8.9	29	3	314	192	129.0	312	12.0	11.00	8.25	3.38	1.43	1.81	11
30BL	4	87	11	POST	929	905	3.10	1984	8.6	52	9	640	522	591.0	221	5.0	6.50	12.50	5.15	1.43	1.51	23
30BU	4	87	11	POST	928	904	1.06	678	8.9	25	3	259	104	83.0	338	15.0	10.00	8.69	2.46	5.00	1.51	9
31AL	4	87	11	POST	947	923	2.00	1280	8.9	23	3	440	372	300.0	176	2.0	6.40	14.38	1.56	0.00	1.81	6
31AU	4	87	11	POST	946	922	0.86	550	9.5	22	10	267	47	114.0	336	27.0	9.40	6.00	2.30	0.00	2.27	13
31BL	4	87	11	POST	949	925	2.20	1408	9.5	29	4	480	408	343.0	158	2.0	6.60	24.38	1.78	0.00	1.51	7
31BU	4	87	11	POST	948	924	0.82	525	9.5	25	11	256	27	82.0	340	39.0	9.20	6.88	2.07	0.00	2.42	15
32AL	4	87	11	POST	943	919	1.40	896	9.0	16	2	324	177	131.0	214	10.0	13.20	24.38	1.69	1.43	1.51	2
32AU	4	87	11	POST	942	918	1.24	794	9.3	16	2	303	125	129.0	284	18.0	12.00	17.81	2.23	1.43	2.12	3
32BL	4	87	11	POST	945	921	2.30	1472	9.1	16	2	520	368	267.0	229	12.0	12.00	34.38	3.69	1.79	1.81	3
[illegible]	[illegible]	87	11	POST	944	920	3.50	2240	9.0	23	3	780	652	400.0	205	13.0	10.20	70.00	5.46	2.14	2.12	8

Raw Soil Sample Data

For Quarter 4/87

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	87	11	POST	959	935	1.80	1152	8.7	46	13	344	294	382.0	259	0.0	0.60	7.81	2.07	3.00	4.84	27
43AU	4	87	11	POST	958	934	0.96	614	8.8	33	7	222	110	157.0	295	0.0	1.48	8.75	1.63	5.00	5.29	7
43BL	4	87	11	POST	961	937	1.30	832	8.7	39	10	267	196	227.0	277	0.0	1.13	4.75	1.67	3.00	2.87	10
43BU	4	87	11	POST	960	936	0.76	486	8.8	34	8	135	62	48.0	339	0.0	1.60	6.88	1.41	4.00	4.38	7
45AL	4	87	11	POST	935	911	2.60	1664	9.0	19	2	600	406	435.0	225	11.0	9.20	20.00	3.77	2.86	0.60	5
45AU	4	87	11	POST	934	910	1.50	960	9.3	19	3	357	168	119.0	322	27.0	12.00	26.88	2.46	3.21	1.21	5
45BL	4	87	11	POST	937	913	1.64	1050	9.2	16	2	368	213	261.0	259	21.0	9.60	15.31	3.38	3.57	0.91	3
45BU	4	87	11	POST	936	912	1.30	832	9.3	16	3	324	100	102.0	319	25.0	11.30	31.25	2.46	2.14	1.21	5

Raw Soil Sample Data

For Quarter 4/87

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	87	11	POST	971	947	2.28	0.56	22.74	2.77	9999.99
07AU	4	87	11	POST	970	946	1.87	0.64	22.70	2.92	9999.99
07BL	4	87	11	POST	973	949	3.24	0.54	22.62	2.98	9999.99
07BU	4	87	11	POST	972	948	1.94	0.74	22.47	3.10	9999.99
11AL	4	87	11	POST	987	963	3.24	1.87	25.61	1.85	9999.99
11AU	4	87	11	POST	986	962	3.08	1.68	25.19	1.71	9999.99
11BL	4	87	11	POST	989	965	4.70	1.76	24.79	1.91	9999.99
11BU	4	87	11	POST	988	964	3.48	1.51	24.21	1.64	9999.99
12AL	4	87	11	POST	979	955	3.32	2.28	23.43	1.71	9999.99
12AU	4	87	11	POST	978	954	2.69	2.65	22.63	1.50	9999.99
12BL	4	87	11	POST	981	957	3.48	2.47	23.68	1.85	9999.99
12BU	4	87	11	POST	980	956	2.61	2.47	21.61	1.52	9999.99
13AL	4	87	11	POST	983	959	1.65	1.02	22.87	1.64	9999.99
13AU	4	87	11	POST	982	958	1.81	1.10	22.65	1.62	9999.99
13BL	4	87	11	POST	985	961	1.60	1.18	22.28	1.73	9999.99
13BU	4	87	11	POST	984	960	1.74	1.18	22.14	1.66	9999.99
23AL	4	87	11	POST	931	907	2.70	0.85	24.61	2.12	9999.99
23AU	4	87	11	POST	930	906	2.55	0.88	24.25	2.26	9999.99
23BL	4	87	11	POST	933	909	2.87	1.18	24.65	2.16	9999.99
23BU	4	87	11	POST	932	908	2.78	1.08	23.99	2.40	9999.99
24AL	4	87	11	POST	975	951	2.34	1.33	24.30	2.14	9999.99
24AU	4	87	11	POST	974	950	1.28	1.68	23.64	1.93	9999.99
24BL	4	87	11	POST	977	953	2.07	1.38	24.96	2.32	9999.99
24BU	4	87	11	POST	976	952	1.28	1.87	23.43	1.99	9999.99
25AL	4	87	11	POST	951	927	1.22	1.14	24.76	2.96	9999.99
25AU	4	87	11	POST	950	926	1.65	1.22	24.24	3.06	9999.99
25BL	4	87	11	POST	953	929	2.48	1.28	25.00	3.12	9999.99
25BU	4	87	11	POST	952	928	1.87	1.37	24.71	3.08	9999.99
28AL	4	87	11	POST	939	915	2.61	0.98	31.56	1.81	9999.99
28AU	4	87	11	POST	938	914	2.17	1.28	30.69	1.75	9999.99
28BL	4	87	11	POST	941	917	3.13	1.33	31.81	1.87	9999.99
28BU	4	87	11	POST	940	916	1.99	1.23	30.56	1.66	9999.99
30AL	4	87	11	POST	927	903	7.49	1.65	30.56	3.49	9999.99
30AU	4	87	11	POST	926	902	6.04	1.79	31.06	3.51	9999.99
30BL	4	87	11	POST	929	905	7.73	1.94	32.68	3.86	9999.99
30BU	4	87	11	POST	928	904	5.07	1.79	31.44	3.49	9999.99
31AL	4	87	11	POST	947	923	3.48	0.34	19.60	1.01	9999.99
31AU	4	87	11	POST	946	922	2.61	0.42	18.82	0.88	9999.99
31BL	4	87	11	POST	949	925	3.48	0.36	19.27	0.95	9999.99
31BU	4	87	11	POST	948	924	2.41	0.46	19.17	0.88	9999.99
32AL	4	87	11	POST	943	919	3.22	0.24	21.56	1.38	9999.99
32AU	4	87	11	POST	942	918	3.13	0.32	20.85	1.27	9999.99
32BL	4	87	11	POST	945	921	5.80	0.35	21.29	1.34	9999.99
32BU	4	87	11	POST	944	920	6.77	0.45	20.86	1.36	9999.99

Raw Soil Sample Data

For Quarter 4/87

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	87	11	POST	959	935	3.22	1.22	22.57	3.33	9999.99
43AU	4	87	11	POST	958	934	2.34	0.70	22.24	3.29	9999.99
43BL	4	87	11	POST	961	937	2.78	0.81	23.35	3.70	9999.99
43BU	4	87	11	POST	960	936	2.07	0.63	23.00	3.60	9999.99
45AL	4	87	11	POST	935	911	7.25	0.63	24.35	1.95	9999.99
45AU	4	87	11	POST	934	910	6.28	0.63	23.80	1.91	9999.99
45BL	4	87	11	POST	937	913	6.04	0.71	24.44	1.79	9999.99
45BU	4	87	11	POST	936	912	5.80	0.68	23.74	1.91	9999.99

APPENDIX H

REMOTE SENSING

9-2-87

PVNGS-87 7-20

0 100 500 1000 Feet

100 300 Meters

H-1. Color infrared imagery for monitoring site 11


H-87
PVNGS
MONITORING SITE 13