



AV-R-92/6088  
AV Project 206018

VOLUME 1 OF 2  
AMBIENT AIR ASSESSMENT  
at the  
UNION PACIFIC RAILROAD YARD  
SACRAMENTO, CA

Submitted to

Dames and Moore  
8801 Folsom Boulevard, Suite 200  
Sacramento, CA 95826

Prepared for

Union Pacific Railroad Company  
1416 Dodge Street, Room 930  
Omaha, NE 68179-0930

September 1992

***AeroVironment, Inc.***

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September 17, 1992

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California Environmental Protection Agency  
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Attention: Mr. James L. Tjosvold, P.E., Chief  
Sacramento Responsible Party Unit  
Site Mitigation Program

Re: Transmittal of Report  
Ambient Air Assessment  
Union Pacific Railroad Yard  
Sacramento, California  
Project No. 00173-072-044

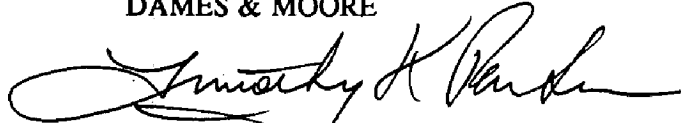
Dear Mr. Tjosvold:

Union Pacific Railroad Company (UPRR) has requested that Dames & Moore transmit the above-referenced report. Presented in the report is a summary of the ambient air monitoring program activities conducted at the site during July and August 1992. The ambient air monitoring program was conducted in accordance with the California Environmental Protection Agency, Department of Toxic Substances Control (DTSC)-approved work plan (AeroVironment, Inc., June 1992).

If you have any questions or require further clarification, please contact the undersigned at (916) 387-7527.

Sincerely,

DAMES & MOORE



Timothy K. Parker  
Project Manager

Attachment

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Omaha, NE 68179-0930

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September 1992

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## Section 1

### INTRODUCTION

#### 1.1 PROJECT BACKGROUND

The Union Pacific Railroad Company (UPRR) Yard Sacramento site is located in south Sacramento in Section 13 of Township 8 North, Range 4 East and in Section 18 of Township 8 North, Range 5 East, Mt. Diablo Base and Meridian (Figure 1-1). The site encompasses an area of approximately 95 acres (Figure 1-2). The site has been divided into an inactive eastern portion, and an active western portion. The inactive portion of the site is fenced, unoccupied, and is the area of the site where former railroad maintenance activities were conducted. The active portion of the site is occupied by a switching area for transferring cars between trains, the main active track, and an office building for Sacramento railroad operations.

Residential property borders the site to the north and east; commercial and residential property borders the site to the west. The main thoroughfares closest to the site include Freeport Boulevard about one-fourth mile west, 24th Street 500 yards east, Portola Way 50 yards north, and Sutterville Road 50 yards south.

The California Environmental Protection Agency, Department of Toxic Substances Control (DTSC) directed UPRR to conduct an ambient air assessment of this site to determine levels of lead, arsenic and asbestos in the air. Dames and Moore has been contracted by UPRR to conduct environmental services as needed at this facility. Dames and Moore subcontracted AeroVironment Inc. (AV) to prepare a quality assurance project plan (QAPP) and to conduct the ambient air monitoring, sample analyses and reporting requested by the DTSC. This report presents the findings from the ambient air assessment.

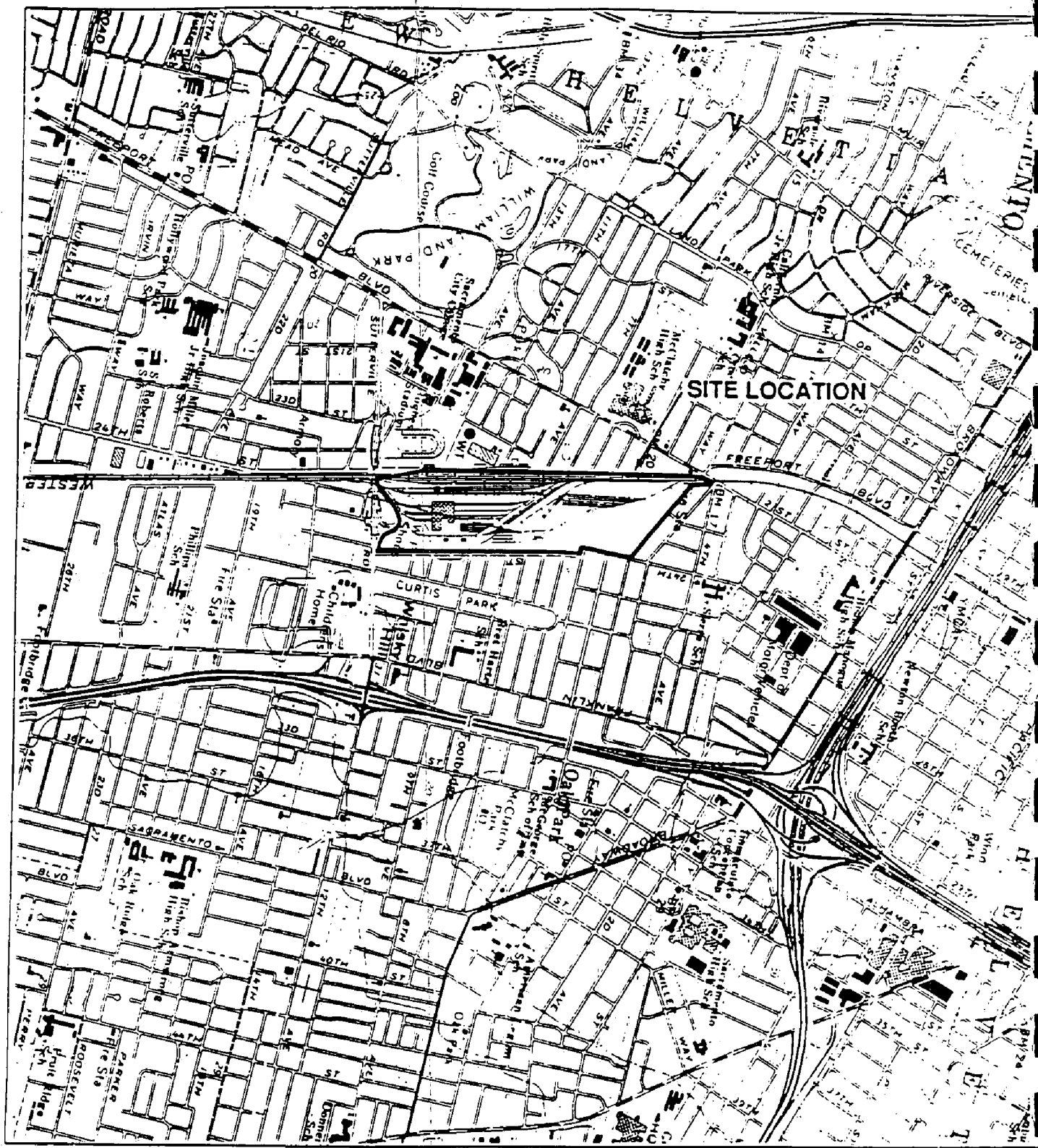
#### 1.2 PROJECT OBJECTIVE

The primary objective of this project was to assess upwind and downwind ambient air concentrations of selected species, including total suspended particulate (TSP) mass, lead, arsenic, and asbestos at the property boundary of the facility and at one location south (upwind) of the property. These data were supplemented by the collection of meteorological data at the site, including wind speed, wind direction, temperature, and wind direction standard deviation ( $\sigma_{\theta}$ ), for assessing the meteorological conditions during each measurement period.

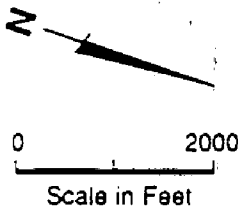
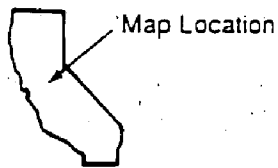
#### 1.3 SCOPE OF WORK

The ambient air assessment program included:

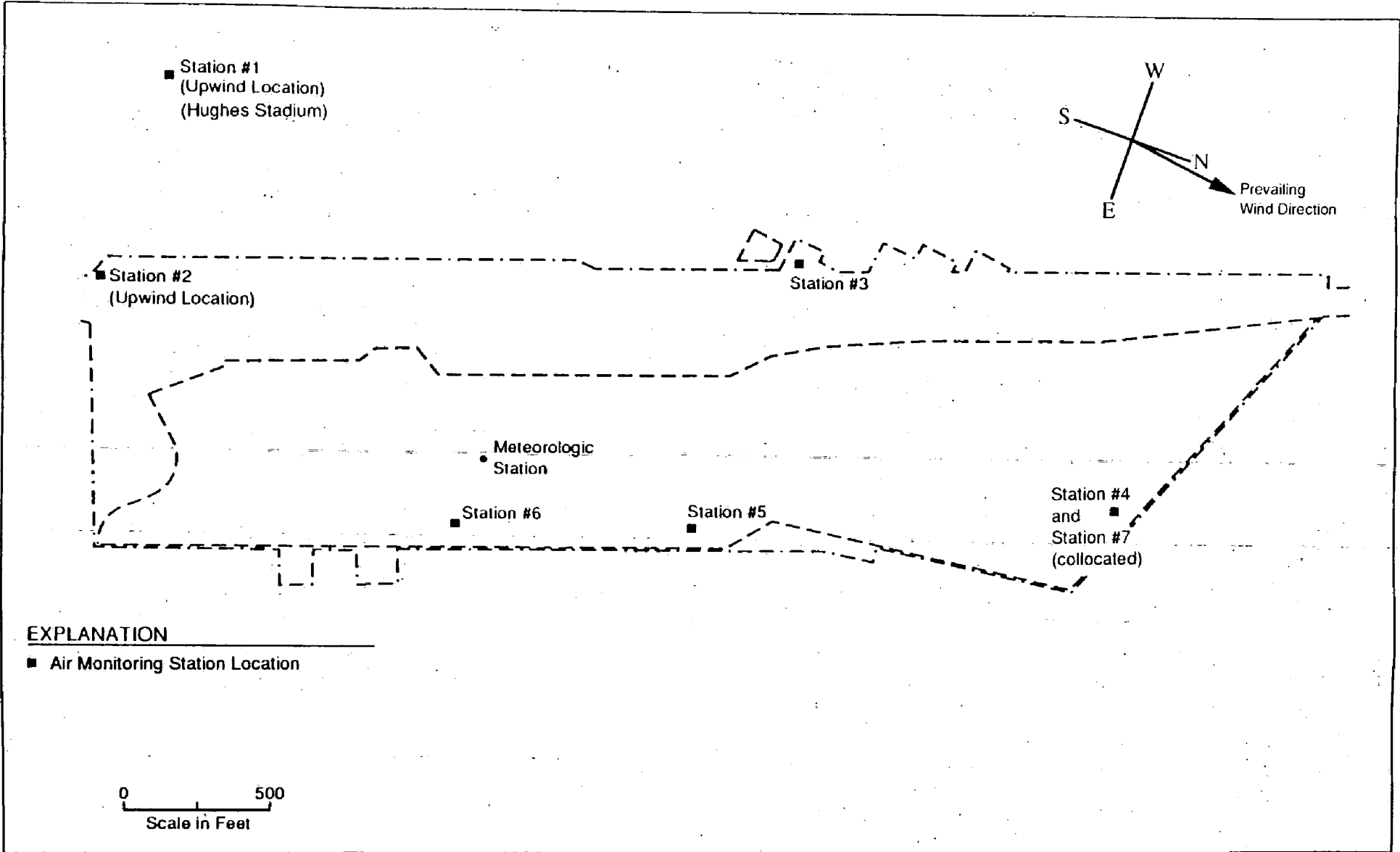
- Collection of ambient particulate matter on filter media at six locations using low volume impactors (lovols). Each sampling period lasted approximately 24 hours.



REFERENCE: USGS Quadrangle 7.5 Minute, Sacramento



**SITE LOCATION MAP**  
 Union Pacific Railroad Yard  
 Sacramento, California  
 SEPTEMBER 1992



**AIR MONITORING  
STATION LOCATIONS**

Union Pacific Railroad Yard  
 Sacramento, California  
 SEPTEMBER 1992

FIGURE 1-2

- Analysis of the "sampled" particulate matter filters for mass, lead, arsenic and asbestos.
- Measurement of ground-level (3 meter) wind speed, wind direction, temperature and turbulence.

The ambient air sampling program was performed during a two-week period commencing July 21, 1992 and ending August 4, 1992.

AV was responsible for preparing the QAPP (AV, 1992a) and assisting Dames and Moore with interfacing with applicable regulatory agencies to obtain approval of the study approach, installing air quality and meteorology monitoring equipment at several locations at the project site, performing laboratory analyses of collected samples and processing data collected during the monitoring period.

During site set-up, an AV scientist instructed Dames and Moore employees on maintaining the field operations, including filter media changing and checking the level and meteorology equipment for proper operation.

AV's QA department performed a system and performance audit of the level and meteorological sensors during the two-week monitoring period.

## Section 2

### MONITORING PROGRAM

On-site meteorological data acquisition began approximately three weeks prior to setting up air sampling equipment at the site. The site-specific meteorological data were assessed prior to air sampling station field set-up to confirm the location of stations with respect to prevailing wind direction.

Samples were collected over fourteen consecutive days between 21 July 1992 and 4 August 1992. Meteorological data was collected during all of July and through 4 August 1992. Twenty-eight upwind, 56 downwind and/or sensitive receptor area, 11 collocated and three field blank samples were collected and analyzed for total mass. Except for the three field blank samples and five of the collocated samples, all samples were also analyzed for lead, arsenic and asbestos.

#### 2.1 SITE SELECTION PROTOCOL

As described in the project QAPP (AV, 1992a), the basic guidelines for selecting the quantity and location of the particulate matter monitoring sites were specified by the DTSC in their Standard Operating Procedures (SOPs) for Air Sampling and Analysis (DHS, 1990, Chapter 19) and their SOPs for meteorological data (DHS, 1990, Chapter 18). Three particulate monitors were located in the predominant downwind direction, one monitor in the predominant upwind location at the property boundary, one monitor approximately 1/4 mile from the site in the predominant upwind direction and a sixth sampler was located along the western site boundary adjacent to a "sensitive receptor" residential area. A seventh sampler was collocated adjacent to one of these samplers, consistent with the DTSC SOPs.

#### 2.2 PARTICULATE MATTER SAMPLERS

Low-volume air samplers (lovols) with "wind decelerator" TSP inlets were used to collect particulate matter. The lovols consisted of sample inlets, filter cassettes and flowmeter/controllers for each sample stream, a pump and timer. The sample inlets and filter cassettes were placed on a pole that was either freestanding or supported by a tripod. The sample inlets were adjusted to a height of about 2 meters, except at the upwind site at the college where the sampler was placed on the roof of the stadium, approximately 12 meters above ground surface.

Each lovol had two filtration channels; one used for the mass and metal analyses, and a second used for asbestos analyses. The total mass and metal sample stream drew ambient air through a preweighed 47-mm ringed-Teflon filter at 16.7 liters per minute (lpm) as shown in Figure 2-1. The second sample stream drew air through a filter cassette holding a 25-mm cellulose ester filter at 1 lpm for asbestos.

2-2

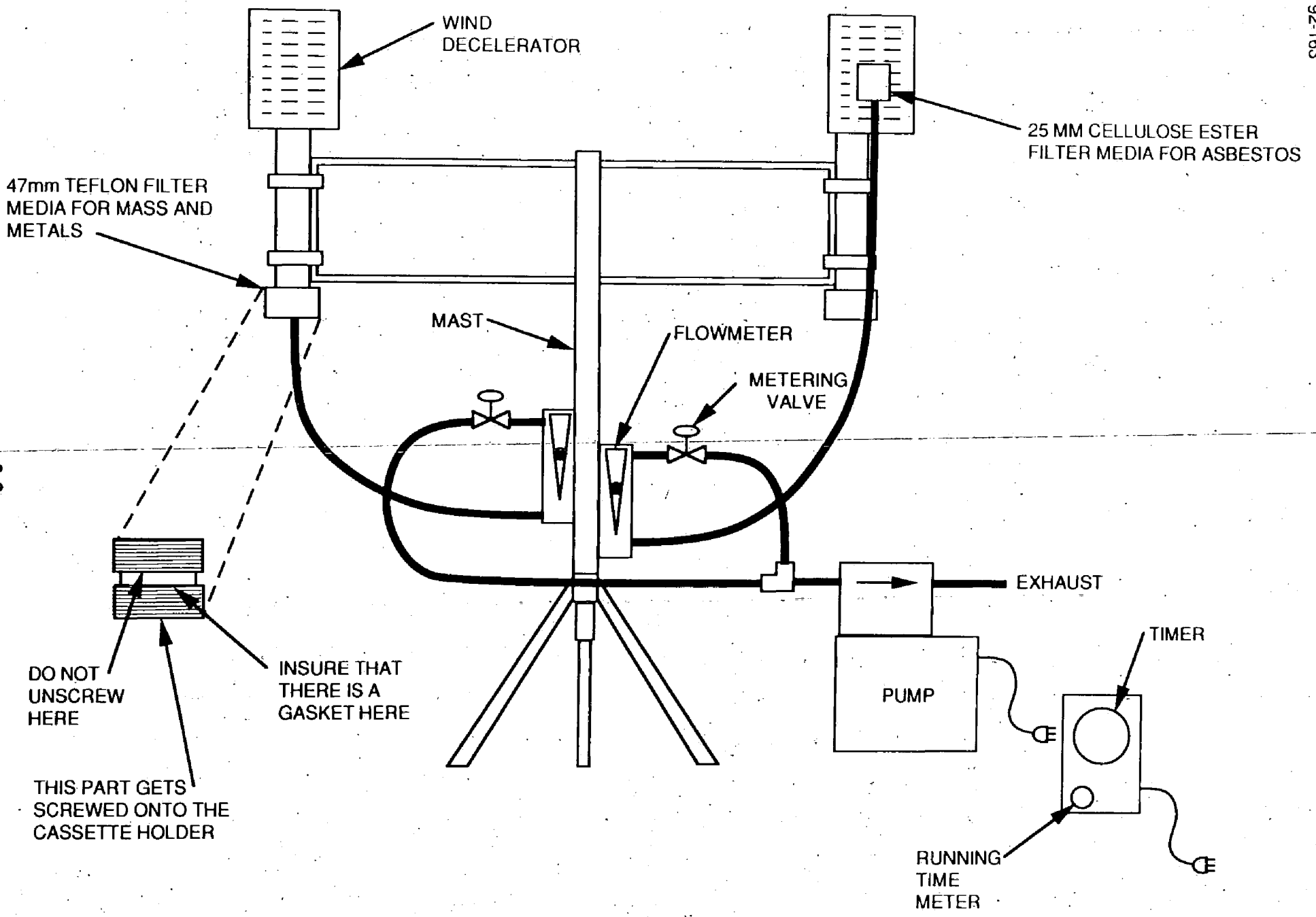


FIGURE 2-1. AeroVironment low volume sampler.

The flow rate for each sample train was monitored by in-line rotameters. The flow rates for both sample trains were adjusted to their appropriate rates using metering valves attached at the rotameter outlets. A single vacuum pump at each site was used for both sampling trains. The sample start and stop times were controlled at all but one site by a timer (the site operator manually started and stopped the sampler at site 2). A running time meter and/or the site operator manually starting and stopping the pumps was used to determine the length of each sampling period.

The Teflon filters were preloaded into plastic filter cassettes by an AV field scientist prior to delivery to the field site. The mixed cellulose ester filters were preloaded into plastic filter cassettes by the laboratory performing the asbestos analyses.

The cassettes containing numbered Teflon filters for mass and metals and numbered cellulose ester filters for asbestos were installed on each particulate sampler at the beginning of each sampling period. The filter cassette and sampler ID, sampling location, sampling period, and sampling rate were entered in a chain-of-custody sampling form. The field operation activities required checking the start and final sample flow rate, removing the exposed filter cassette, then installing a new filter cassette for the following sampling period and checking its sample flow rate. The exposed filters, along with a chain of custody form, were shipped via express service to the analysis laboratories.

The lovols were calibrated on-site at the beginning and end of the project. A mass flowmeter was used to perform the flow calibration. A description of AV's lvol calibration procedures is described in detail in the project QAPP (AV, 1992a).

### 2.3 METEOROLOGICAL STATION

To obtain meteorological data, a portable weather station was set up at the end of June 1992 and operated through the end of the particulate matter monitoring period. The meteorological instrumentation was placed near the center of the inactive portion of the site at the location shown in Figure 1-2. The meteorological system conformed to the U.S. Environmental Protection Agency's (EPA) meteorological station specifications and operation guidance document (EPA, 1987a). The station was installed on a tripod with a two-meter mast. The system was calibrated during the field installation and again at end of the field study. Wind speed, direction, sigma theta (60-minute averaged wind direction standard deviation), and ambient temperature were continuously monitored and processed into hourly averages by the in-field meteorological and data processing system. Further details regarding the instrumentation and operation are included in the QAPP for this project (AV, 1992a).

## **2.4 SAMPLE ANALYSES**

Laboratory analyses for total particulate mass, lead and arsenic in the filter samples were performed by Keystone/NEA in Portland, Oregon. Laboratory analyses for asbestos in the filter samples were performed by EMS Laboratories in Pasadena, California.

### **2.4.1 Filter Analysis for Total Mass**

All filters were equilibrated in a temperature- and humidity-controlled room, inspected for damage, numbered, then weighed on a Cahn 27 electronic balance. After field use, the filters were returned to the laboratory for final processing. Upon receipt at the laboratory, the filter numbers were checked against the chain-of-custody record included with the shipment from the field. The filters were then placed in a temperature- and humidity-controlled room to equilibrate for at least 48 hours. The filters were then inspected for damage and weighed a second time on the electronic balance to determine the total particulate mass deposit. The mass concentration was then obtained as the quotient of net weight and total air volume sampled.

### **2.4.2 Filter Analysis for Lead and Arsenic**

After the final mass determination, the filter samples were analyzed for lead and arsenic by X-ray fluorescence (XRF); a method approved by the DTSC for analysis of ambient air samples (DHS, 1990, Chapter 19). Additionally, Keystone/NEA's lead determination method has been approved by the EPA as an "equivalent method" (EPA, 1989). The lead and arsenic concentrations were calculated for each sample using the total air volume sampled in a manner similar to the mass concentration calculation.

### **2.4.3 Filter Analysis for Asbestos**

The exposed mixed cellulose ester filters were sent to EMS Laboratories for analysis by transmission electron microscopy (TEM) for asbestos particles. The TEM analysis was performed using the EPA Yamate II method. This analysis provided results for seven asbestos structures (chrysotile, amphibole, crocidolite, tremolite, amosite, anthophyllite and actinolite). EMS has been accredited by the National Institute of Standards and Technology for airborne asbestos and asbestos bulk sample analyses.

## **2.5 SAMPLE HANDLING**

A chain-of-custody form was filled out for each sampling period. Copies of these chain-of-custody records are included in Appendix A. These records documented sample possession from the time of collection to the time of receipt by the laboratory. They included:

- sample identification number
- date and time of sampling
- beginning and end sampler flow rate
- analyses required
- sampling team members' names and appropriate signatures
- shipping time and date

Additionally, the site technician kept a second field log for the monitoring activities conducted at each site. Upon receipt of the samples by the analysis laboratories, the filters were checked against the chain-of-custody records for accuracy and completeness. The Dames and Moore field logs were used to verify and correct nine filter ID entry errors found by the laboratory sample custodian in the chain-of-custody forms.

## Section 3

### RESULTS

#### 3.1 AMBIENT PARTICULATE MATTER RESULTS

The measured total particulate matter concentration averaged  $35 \mu\text{g}/\text{m}^3$  at the upwind site at the stadium (site 1, see Figure 1-2) and  $41 \mu\text{g}/\text{m}^3$  at the upwind site at the UPRR Yard boundary (site 2). The total mass concentration averaged  $30 \mu\text{g}/\text{m}^3$  at site 4, the most predominantly downwind site. The total mass concentration averaged  $32 \mu\text{g}/\text{m}^3$  and  $35 \mu\text{g}/\text{m}^3$  at sites 5 and 6, respectively; these sites were along the eastern border of the UPRR Yard, downwind during most sampling periods. The total mass concentration averaged  $40 \mu\text{g}/\text{m}^3$  at site 3. This site was downwind of the UPRR Yard for two sampling periods when the winds were out of the south-southeast. California Air Resources Board (CARB) air quality data for a station near the UPRR Yard recorded a range of 37 to  $93 \mu\text{g}/\text{m}^3$  and an average of  $64 \mu\text{g}/\text{m}^3$  (CARB, 1990a).

The lead concentration varied from 0.010 to  $0.020 \mu\text{g}/\text{m}^3$  with the highest values observed at the upwind property boundary site. The arsenic values for all sites were between 0.0000 and  $0.0013 \mu\text{g}/\text{m}^3$ , which was near the analysis detection limits and similar in magnitude to the overall uncertainty for the measurement. CARB 1990 air quality data for a station near the UPRR Yard reported a range of 0.020 to  $0.070 \mu\text{g}/\text{m}^3$  for lead and an average lead concentration of  $0.038 \mu\text{g}/\text{m}^3$  (CARB, 1990a). CARB data on arsenic air levels were available from an ambient air toxics stations in Citrus Heights and Stockton, California. Arsenic levels at these sites ranged from not-detected to  $0.0032 \mu\text{g}/\text{m}^3$  (CARB, 1992).

Asbestos fibers were detected on two samples at the stadium (site 1) and on four samples at the upwind site at the UPRR Yard boundary (site 2). Asbestos fibers were detected on three samples collected at site 4, the most predominantly downwind site. Asbestos fibers were detected on five samples at sites 5 and 6, respectively; these sites were along the eastern border of the UPRR Yard, downwind during most sampling periods. Asbestos fibers were detected on two samples at site 3. This site was downwind of the UPRR Yard for two sampling periods when the winds were out of the south-southeast. The asbestos concentration for these seventeen samples varied from 0.004 to 0.020 structures per cubic centimeter (cc). (The analysis lower detection limit was 0.004 structures per cc; the analysis uncertainties was similar in magnitude to the detection limits. Analysis uncertainties for each asbestos sample analysis is included in Appendix D.) CARB urban air quality data for asbestos are quite limited, but indicate a range of not-detected to 0.0148 structures/cc, and an average of 0.0013 structures/cc (CARB, 1990b).

A complete summary of the results for the particulate analyses is shown in Table 3-1. The laboratory data reports for each sample analyzed are included in Appendix B for mass, Appendix C for lead and arsenic and Appendix D for asbestos. The filter identification numbers provided in the chain-of-custody data in Appendix A can be used to identify the sampling location and data for each of the sample results shown in Appendices B through D.

Table 3-1. Sampling dates and ambient particulate matter concentration summary.

Sample Date	21-Jul	22-Jul	23-Jul	24-Jul	25-Jul	26-Jul	27-Jul	28-Jul	29-Jul	30-Jul	31-Jul	01-Aug	02-Aug	03-Aug	AUE	MIN	MAX		
Prevailing Wind Dir.	S	UA	UA	UA	S	UA	SSW	SSW	S	SSW	SSW	SSE	S	SSE					
SITE	PARAMETER																		
1	RUN TIME (MIN)	1440	1435	1492	1432	1430	1424	1442	1430	1429	1435	1439	1444	1426	1442	1439	1424	1492	
1	MASS, UC/103	4.7#	36.8	50.2	47.9	32.9	28.0	46.0	39.6	34.9	27.4	44.2	35.6	28.3	40.7	35.5	4.7	50.2	
1	As, UC/103	0.0000	0.0008	0.0010	0.0006	0.0002	0.0000	0.0011	0.0012	0.0008	0.0004	0.0009	0.0001	0.0000	0.0005	0.0005	0.0000	0.0012	
1	As, Uocer, ug/n3	0.0001	0.0005	0.0007	0.0006	0.0004	0.0006	0.0008	0.0005	0.0005	0.0004	0.0013	0.0005	0.0006	0.0007	0.0006	0.0001	0.0013	
1	Pb, UC/103	0.0092	0.0061	0.0110	0.0085	0.0056	0.0085	0.0139	0.0069	0.0066	0.0061	0.0082	0.0082	0.0102	0.0101	0.0085	0.0056	0.0139	
1	Pb, Uocer, ug/n3	0.0007	0.0007	0.0007	0.0007	0.0006	0.0007	0.0009	0.0006	0.0007	0.0006	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0006	0.0009
1	ASBES, Strcs/cc	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0161	0.0040	ND	0.0014	0.0000	0.0161	
2	RUN TIME (MIN)	1405	1432	1443	1432	1442	1436	1454	1427	1438	1425	1447	1443	1423	1439	1435	1405	1454	
2	MASS, UC/103	45.6	39.6	58.1	48.5	36.0	40.1	53.0	45.8	41.3	30.9	3.1#	43.2	35.7	52.8	41.0	3.1	58.1	
2	As, UC/103	0.0003	0.0002	0.0002	0.0003	0.0003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0003	0.0003	0.0006	0.0000	0.0002	0.0000	0.0006	
2	As, Uocer, ug/n3	0.0008	0.0007	0.0009	0.0008	0.0006	0.0009	0.0011	0.0009	0.0009	0.0009	0.0003	0.0008	0.0007	0.0010	0.0008	0.0003	0.0011	
2	Pb, UC/103	0.0128	0.0102	0.0159	0.0139	0.0093	0.0152	0.0202	0.0157	0.0150	0.0157	0.0016	0.0122	0.0111	0.0177	0.0133	0.0016	0.0202	
2	Pb, Uocer, ug/n3	0.0009	0.0007	0.0010	0.0009	0.0007	0.0010	0.0011	0.0009	0.0009	0.0009	0.0005	0.0008	0.0008	0.0010	0.0009	0.0005	0.0011	
2	ASBES, Strcs/cc	0.0041	0.0040	ND	ND	ND	ND	0.0039	ND	ND	ND	ND	ND	0.0040	ND	0.0011	0.0000	0.0041	

NA = Sample not analyzed.

ND = Not detected at analysis lower limit.

IN = Instrument malfunction.

QC = Quality control field blank.

# = TSP value unrealistic; probable preweighing error.

NA = Sample used incorrectly.

NA = Sample separate and not for analysis; dist. from collocated monitor at site 4 on 7/29/97.

2-2

Table 3-1 continued. Sampling dates and ambient particulate matter concentration summary.

Sample Date	21-Jul	22-Jul	23-Jul	24-Jul	25-Jul	26-Jul	27-Jul	28-Jul	29-Jul	30-Jul	31-Jul	01-Aug	02-Aug	03-Aug	AVE	MIN	MAX	
Prevailing Wind Dir.	S	VA	VA	VA	S	VA	SSW	SSW	S	SSW	SSW	SSE	S	SSE				
SITE	PARAMETER																	
3	RUN TIME (MIN)	1405	1429	1424	1431	1335	1430	1409	1427	1438	1424	1466	1431	1418	1443	1422	1335	1466
3	MASS, UC/M3	54.6	37.8	32.5	43.3	52.3	29.8	41.5	39.6	41.6	40.3	44.2	39.8	31.6	28.0	39.8	28.0	54.6
3	As, UC/M3	0.0011	0.0003	0.0000	0.0004	0.0000	0.0013	0.0004	0.0013	0.0000	0.0007	0.0004	0.0004	0.0003	0.0003	0.0005	0.0000	0.0013
3	As, Uacer, ug/n3	0.0006	0.0004	0.0006	0.0005	0.0005	0.0008	0.0007	0.0005	0.0006	0.0008	0.0005	0.0006	0.0006	0.0004	0.0006	0.0004	0.0008
3	Pb, UC/M3	0.0088	0.0065	0.0090	0.0072	0.0060	0.0122	0.0120	0.0066	0.0096	0.0134	0.0071	0.0087	0.0075	0.0063	0.0086	0.0060	0.0134
3	Pb, Uacer, ug/n3	0.0007	0.0006	0.0007	0.0007	0.0007	0.0009	0.0008	0.0006	0.0007	0.0009	0.0007	0.0007	0.0007	0.0005	0.0007	0.0005	0.0009
3	ASBEST., Stros/cc	ND	ND	ND	ND	0.0040	ND	ND	ND	ND	ND	0.0040	ND	ND	0.0006	0.0000	0.0040	
4	RUN TIME (MIN)	1405	1419	1422	1429	1401	1419	1446	1423	0	1418	1463	1428	1403	1419	1321	0	1463
4	MASS, UC/M3	29.9	28.0	36.4	32.7	26.5	29.7	36.1	32.9	QC	20.1	36.1	29.4	23.7	33.0	30.3	20.1	36.4
4	As, UC/M3	0.0000	0.0006	0.0000	NA	0.0000	0.0004	NA	NA	NA	0.0000	0.0002	0.0003	0.0007	0.0002	0.0002	0.0000	0.0007
4	As, Uacer, ug/n3	0.0005	0.0004	0.0006	NA	0.0004	0.0006	NA	NA	NA	0.0004	0.0005	0.0005	0.0004	0.0007	0.0004	0.0000	0.0007
4	Pb, UC/M3	0.0069	0.0053	0.0092	NA	0.0050	0.0099	NA	NA	NA	0.0058	0.0067	0.0066	0.0054	0.0121	0.0052	0.0000	0.0121
4	Pb, Uacer, ug/n3	0.0006	0.0006	0.0007	NA	0.0006	0.0007	NA	NA	NA	0.0006	0.0006	0.0006	0.0006	0.0008	0.0005	0.0000	0.0008
4	ASBEST., Stros/cc	ND	0.0199	0.0040	NA	ND	0.0040	NA	NA	NA	ND	ND	ND	ND	ND	0.0020	0.0000	0.0199

NA = Sample not analyzed.

ND = Not detected at analysis lower limit.

IM = Instrument malfunction.

QC = Quality control field blank.

N = TSP value unrealistic; probable preweighing error.

VA = Variable wind direction.

uu = Last numeric and letter analysis data from collected sample.

Table 3-1 continued. Sampling dates and ambient particulate matter concentration summary.

Sample Date		21-Jul	22-Jul	23-Jul	24-Jul	25-Jul	26-Jul	27-Jul	28-Jul	29-Jul	30-Jul	31-Jul	01-Aug	02-Aug	03-Aug	AVE.	MIN	MAX
5	Prevailing Wind Dir.	S	UA	UA	UA	S	UA	SSH	SSH	S	SSH	SSH	SSE	S	SSE			
5	RUN TIME (MIN)	1405	1441	1426	1452	1411	1402	1454	1428	1429	1418	1466	1431	1404	1421	1428	1402	1466
5	MASS, UC/M3	32.5	32.1	40.9	39.3	26.1	25.0	40.6	32.1	32.8	23.6	35.9	29.2	25.8	31.4	32.0	23.6	40.9
5	As, UC/M3	0.0007	0.0000	0.0003	0.0004	0.0000	0.0005	0.0000	0.0000	0.0005	0.0004	0.0005	0.0006	0.0001	0.0006	0.0003	0.0000	0.0007
5	As, Uncer, ug/n3	0.0006	0.0006	0.0006	0.0005	0.0004	0.0006	0.0008	0.0006	0.0005	0.0053	0.0004	0.0005	0.0005	0.0006	0.0009	0.0004	0.0053
5	Pb, UC/M3	0.0095	0.0076	0.0096	0.0070	0.0061	0.0089	0.0133	0.0096	0.0074	0.0053	0.0059	0.0061	0.0065	0.0082	0.0079	0.0059	0.0133
5	Pb, Uncer, ug/n3	0.0007	0.0007	0.0007	0.0007	0.0006	0.0007	0.0009	0.0007	0.0006	0.0006	0.0005	0.0006	0.0006	0.0007	0.0007	0.0005	0.0009
5	ASBESTOS, Strcs/cc	0.0041	MD	MD	MD	MD	MD	MD	MD	MD	MD	MD	MD	MD	MD	0.0119	0.0000	0.0119
6	RUN TIME (MIN)	1405	1442	1424	1452	946	1405	1453	1431	1429	1420	1456	1429	1405	1426	1394	946	1456
6	MASS, UC/M3	30.0	31.4	43.1	41.0	43.4	IR	42.9	35.1	30.4	24.9	37.7	33.5	28.7	35.9	35.2	24.9	43.4
6	As, UC/M3	0.0005	0.0006	0.0000	0.0004	0.0007	MA	0.0007	0.0000	0.0000	0.0003	0.0003	0.0001	0.0003	0.0006	0.0003	0.0000	0.0007
6	As, Uncer, ug/n3	0.0005	0.0005	0.0007	0.0005	0.0007	MA	0.0010	0.0005	0.0004	0.0004	0.0005	0.0006	0.0005	0.0006	0.0005	0.0000	0.0010
6	Pb, UC/M3	0.0062	0.0069	0.0119	0.0081	0.0079	MA	0.0163	0.0088	0.0069	0.0071	0.0069	0.0086	0.0065	0.0079	0.0079	0.0000	0.0163
6	Pb, Uncer, ug/n3	0.0007	0.0007	0.0008	0.0007	0.0009	MA	0.0010	0.0006	0.0006	0.0006	0.0006	0.0007	0.0006	0.0007	0.0006	0.0000	0.0010
6	ASBESTOS, Strcs/cc	MD	0.0040	MD	MD	MD	MD	0.0039	MD	0.0161	MD	MD	MD	MD	MD	0.0040	0.0020	0.0161

MA = Sample not analyzed.

MD = Not detected at analysis lower limit.

IR = Instrument malfunction.

QC = Quality control field blank.

M = TSP value unrealistic; probable preweighing error.

UA = Variable wind direction.

MM = Lead, arsenic and asbestos analysis data from collocated sampler at site 4 used as primary data for site 4 on 7/24, 7/27 and 7/28, not as collocated QC data.

3-4

Table 3-1 continued. Sampling dates and ambient particulate matter concentration summary.

Sample Date	21-Jul	22-Jul	23-Jul	24-Jul	25-Jul	26-Jul	27-Jul	28-Jul	29-Jul	30-Jul	31-Jul	01-Aug	02-Aug	03-Aug	AVE	MIN	MAX
Prevailing Wind Dir.	S	UA	UA	UA	S	UA	SSW	SSW	S	SSW	SSW	SSE	S	SSE			
COLL-4: RUN TIME (MIN)	1405	1419	1422	1429	1401	1419	1446	1423	0	1418	1463	1428	0	1419	1221	0	1463
COLL-4: MASS, UG/M3	31.2	30.9	40.8	39.9	29.0	30.3	43.6	47.4	QC	23.9	39.0	33.8	QC	34.7	35.4	23.9	47.4
COLL-4: As, UG/M3	NA	NA	NA	0.0005	0.0000	0.0007	0.0004	0.0008	0.0000	NA	NA	NA	NA	NA	0.0002	0.0000	0.0008
COLL-4: As, Ucer, ug/n3	NA	NA	NA	0.0004	0.0005	0.0006	0.0008	0.0007	0.0000	NA	NA	NA	NA	NA	0.0002	0.0000	0.0008
COLL-4: Pb, UG/M3	NA	NA	NA	0.0063	0.0059	0.0095	0.0134	0.0107	0.0000	NA	NA	NA	NA	NA	0.0033	0.0000	0.0134
COLL-4: Pb, Ucer, ug/n3	NA	NA	NA	0.0006	0.0006	0.0007	0.0009	0.0008	0.0000	NA	NA	NA	NA	NA	0.0003	0.0000	0.0009
COLL-4: ASBES., Strcs/cc	NA	NA	NA	ND	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	0.0000	0.0000	0.0000
COLL-4:																	
COLL-4:																	

NA = Sample not analyzed.

ND = Not detected at analysis lower limit.

IN = Instrument malfunction.

QC = Quality control field blank.

N = TSP value unrealistic; probable preweighing error.

UA = Variable wind direction.

NN = Lead, arsenic and asbestos analysis data from collocated sampler at site 4 used as primary data for site 4 on 7/24, 7/27, and 7/28, not as collocated QC data.

COLL-4 = Collocated sampler at site 4 used for backup and collection of quality control duplicates and blank samples.

PROJECT, #206018  
SITE 1 UPRR  
7/21/92 (9 AM) - 8/4/92 (9 AM)  
AEROVIRONMENT INC.

\*\*\*\*\*  
\* FINAL DATA \*  
\* AS OF 10/SEP/92 \*  
\*\*\*\*\*

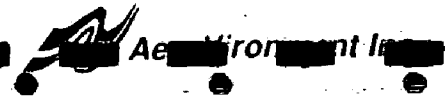
CLOCK HOUR [LOCAL STANDARD TIME]

DY	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	00	01	02	03	04	05	06	07	08	PREV
21	S	S	S	SSW	WSW	WSW	SW	SSW	SW	SW	SSW	SSW	SSW	SSW	S	S	SSE	SSE	S	S	S	S	S	S	S
22	S	S	SSW	S	SSW	SW	SW	WNW	W	SW	SW	SW	SW	SW	SSW	S	SSE	SSE	SSE	S	SSE	ENE	E	WSW	[VA]
23	SE	SSE	SSW	W	NW	NW	NW	WNW	WSW	SW	SW	SW	SW	SW	SW	S	SSE	S	S	S	S	S	SSE	S	[VA]
24	SSW	SSW	SSW	SSW	WSW	WSW	SW	WSW	SW	SW	SSW	SW	SSW	SSW	SSW	SSE	SSE	SSE	S	SSE	S	S	SSW	SSW	[VA]
25	SSW	SSW	SSW	WSW	SW	SW	SW	SW	SW	SSW	SSW	SSW	SSW	SSW	S	S	S	S	S	S	S	S	S	S	S
26	S	S	SW	WSW	WSW	WSW	WSW	SW	WSW	SW	SSW	SSW	SW	SW	SW	SSE	SSE	S	S	S	SSE	S	S	S	[VA]
27	SSE	SSW	N	WNW	NNW	NW	NW	NW	WSW	SW	SSW	SSW	SSW	SSW	SSW	S	SSE	SSE	S	S	S	S	S	SSW	SSW
28	SSW	WSW	S	SW	SW	SW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	S	SSE	SSE	SSE	SSE	S	S	S	S	S	SSW
29	S	SSW	SW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	S	S	S	S	S	S	S	S	S	S	S	S
30	SSW	SSW	SSW	SSW	SW	SW	SW	SW	SW	SW	SSW	SSW	SSW	SSW	SSW	S	S	S	S	S	S	SSE	SSE	S	SSW
31	S	SSW	WSW	WSW	W	W	WSW	SW	SW	SW	SSW	SSW	SSW	SSW	SSW	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	SSW
1	S	S	S	NW	SW	SW	W	WSW	SW	SW	SSW	SSW	SSW	S	SE	SE	SE	SE	SSE	SSE	SSE	SSE	SSE	S	SSE
2	SSW	SSW	SW	WSW	WSW	WSW	WSW	SSW	SW	SSW	S	S	S	S	SSE	SSE	SSE	S	S	SSE	S	S	SSE	S	S
3	S	S	SSW	SW	WSW	WSW	SW	SW	SSW	SSW	SSW	SSW	S	S	SSE	SE	SE	SE	SSE	SSE	SSE	SSE	SSE	S	SSE
4	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
5	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
6	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
7	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
8	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
9	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
10	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
11	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
12	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
13	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
14	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
15	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
16	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
17	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
18	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
19	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
20	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
PV	S	SSW	SSW	[VA]	WSW	SW	SW	SW	SW	SW	SSW	SSW	SSW	SSW	S	S	SSE	S	S	S	S	S	S	S	S

00004 [Program: EDMS\_MONTHSUM

Version: LC:12-MAY-92

TABLE 3-2. Prevailing wind direction during the fourteen sampling periods.





PROJECT, #206018

SITE 1 UPRR

JULY, 1992

AEROVIRONMENT INC.

\*\*\*\*\*  
\* FINAL DATA \*  
\* AS OF 25/AUG/92 \*  
\*\*\*\*\*

CLOCK HOUR [LOCAL STANDARD TIME]

DY	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVG	PEAK
1	1.18	0.98	0.60	0.82	1.13	1.10	0.95	0.65	1.04	1.17	1.09	1.72	1.80	2.18	1.96	1.78	2.27	1.78	1.89	3.26	3.47	2.67	2.48	2.50	1.69	3.47
2	1.60	1.81	2.25	2.38	2.65	2.82	2.72	2.42	2.96	2.54	2.09	1.86	2.26	1.97	1.89	2.05	1.96	2.29	2.23	1.87	2.96	2.66	2.18	1.75	2.26	2.96
3	2.14	1.73	1.86	2.02	1.45	1.50	2.14	2.21	2.66	2.07	1.65	1.60	1.57	1.64	1.98	2.50	2.68	3.95	4.24	4.29	4.27	4.46	4.68	4.43	2.65	4.68
4	4.61	5.07	5.12	4.74	3.94	3.62	3.59	3.01	2.95	3.54	2.90	3.34	3.97	4.02	4.38	4.91	3.65	3.21	3.38	3.86	3.89	3.39	3.27	3.47	3.83	5.12
5	2.43	2.22	2.08	1.43	1.71	1.85	2.18	2.14	2.42	2.45	2.39	1.98	1.89	2.17	2.00	1.85	2.08	2.27	2.97	3.18	3.38	3.65	3.04	2.77	2.36	3.65
6	2.24	1.42	1.78	1.72	1.85	1.95	2.38	2.37	3.04	2.21	1.80	2.07	2.11	2.57	2.63	2.71	3.27	4.17	4.60	3.96	4.07	3.49	4.00	4.33	2.78	4.60
7	3.22	2.77	1.84	1.55	2.21	1.60	1.05	0.92	1.32	1.21	1.30	1.75	2.28	2.89	2.12	2.02	1.86	2.06	2.03	2.14	1.49	0.39	1.35	0.64	1.75	3.22
8	0.51	1.30	1.15	1.26	0.84	0.63	0.56	0.65	1.11	1.06	1.02	1.03	1.34	1.65	2.03	1.49	2.07	2.23	1.93	1.65	1.91	2.12	1.79	1.33	1.36	2.23
9	1.67	1.13	1.21	1.31	1.58	1.32	0.61	0.85	2.11	1.77	1.26	1.61	1.72	1.84	2.35	2.33	2.92	3.71	3.01	3.89	3.09	3.08	2.74	1.67	2.03	3.89
10	2.00	2.36	2.09	2.06	1.97	1.72	1.93	1.18	2.64	3.02	3.09	3.32	2.75	3.73	4.19	4.69	4.70	4.76	4.54	3.81	3.81	3.21	3.22	4.16	3.12	4.76
11	4.14	4.01	3.52	3.76	3.33	4.64	4.49	3.99	3.53	4.03	4.07	3.47	3.81	3.99	4.01	3.89	4.03	3.59	4.08	3.80	3.48	3.47	3.04	2.92	3.80	4.64
12	3.06	3.16	2.96	2.80	2.97	2.56	2.42	1.34	1.69	2.15	2.33	2.02	1.60	1.96	1.59	1.82	2.55	2.57	2.16	1.99	2.10	2.31	2.36	2.62	2.30	3.16
13	2.30	2.04	1.47	1.19	0.93	1.35	1.88	1.99	2.66	2.52	1.98	1.87	2.34	3.02	3.13	3.21	3.33	2.46	3.70	4.53	3.94	3.32	2.55	2.13	2.49	4.53
14	1.83	2.51	2.59	2.60	2.37	2.66	2.41	2.68	3.10	2.91	2.47	2.34	2.32	2.21	2.66	3.23	3.58	3.99	4.41	4.17	2.97	2.55	3.05	2.92	2.86	4.41
15	1.89	2.68	1.90	2.39	2.62	2.55	2.27	2.84	2.66	2.55	2.67	2.21	2.39	2.37	2.67	2.99	3.54	3.65	3.89	4.08	3.47	3.42	3.24	2.70	2.82	4.08
16	2.86	2.99	2.67	2.89	2.62	2.75	2.44	2.43	3.03	2.45	2.33	1.95	1.68	1.53	1.83	2.35	2.66	2.91	3.43	3.27	2.63	3.00	3.11	3.13	2.62	3.43
17	2.65	3.39	3.21	3.56	3.82	3.07	2.97	3.75	4.93	4.36	4.35	3.97	3.83	3.66	3.21	3.97	4.40	4.98	4.71	4.22	3.71	4.16	4.45	4.95	3.93	4.98
18	5.28	4.90	4.78	4.64	4.48	4.32	3.79	3.64	3.56	2.84	2.99	2.08	1.60	1.90	1.99	2.49	3.37	3.82	4.06	3.69	3.14	3.33	3.26	3.53	3.48	5.28
19	3.26	2.90	2.91	3.24	3.11	3.29	3.21	3.35	3.86	4.23	4.31	4.14	3.73	3.54	3.60	3.55	4.57	4.76	4.93	5.01	4.67	4.91	4.03	4.79	3.91	5.01
20	4.80	4.88	5.02	5.14	4.95	4.58	4.42	4.05	4.47	3.03	2.73	2.06	1.80	1.84	1.87	1.93	2.00	2.70	4.10	4.23	3.97	3.55	3.05	2.93	3.50	5.14
21	2.88	2.86	2.64	2.49	2.81	2.74	2.60	2.44	3.06	3.02	2.62	2.77	2.20	2.30	2.73	3.57	4.28	4.57	4.67	4.67	4.43	3.92	3.40	3.32	3.21	4.67
22	3.73	3.71	3.64	3.92	3.83	3.71	3.94	4.17	4.86	4.79	4.16	2.29	2.04	1.75	1.52	1.95	1.95	1.79	2.94	3.88	3.25	3.16	2.76	1.99	3.16	4.86
23	1.71	2.19	1.69	1.87	1.82	1.27	0.81	0.77	0.66	0.74	1.44	1.40	1.56	1.89	2.04	1.91	2.20	2.01	3.18	4.06	3.62	2.89	2.16	2.51	1.93	4.06
24	1.70	2.35	2.67	2.97	2.81	2.72	2.22	2.06	3.47	2.35	1.84	1.44	1.23	1.40	1.82	1.99	2.07	2.23	2.80	3.39	2.87	2.71	2.07	2.09	2.30	3.47
25	2.54	2.10	1.97	2.50	2.24	3.05	2.67	2.44	2.45	1.70	1.80	2.15	2.22	2.18	2.68	2.63	2.96	3.36	3.80	3.86	3.26	2.59	3.12	2.31	2.61	3.86
26	2.98	2.76	2.45	2.83	2.96	2.85	3.15	2.67	2.65	2.45	1.89	1.52	1.98	1.93	2.14	2.06	2.45	2.48	3.08	3.36	2.54	2.04	1.53	1.58	2.43	3.36
27	1.27	1.98	1.84	1.99	1.91	2.09	2.06	1.56	1.44	0.51	0.51	0.68	1.31	1.98	1.69	1.80	1.86	2.04	2.46	2.95	3.32	3.02	1.98	1.61	1.83	3.32
28	1.62	1.89	1.82	1.97	2.25	2.01	2.08	2.12	2.18	1.66	1.09	1.34	1.68	1.75	2.20	3.28	3.40	3.41	3.51	3.77	3.39	2.99	2.65	2.79	2.37	3.77
29	2.72	2.44	2.48	2.57	2.78	3.42	3.35	2.50	3.19	3.10	2.62	2.14	1.58	1.95	2.63	3.39	3.82	4.12	4.42	4.56	4.50	3.96	4.14	3.85	3.18	4.56
30	3.70	3.86	3.72	3.59	3.86	4.01	4.41	4.07	3.66	3.46	3.67	3.33	3.53	3.17	2.92	3.43	3.50	3.48	3.39	3.98	4.11	3.74	3.88	3.48	3.66	4.41
31	3.75	3.88	4.02	4.02	4.13	3.25	2.79	2.75	2.72	2.13	2.10	1.95	1.60	1.87	1.51	1.44	1.87	2.05	2.46	3.35	3.30	3.63	3.56	3.45	2.82	4.13
AV	2.65	2.72	2.58	2.65	2.64	2.61	2.53	2.39	2.78	2.52	2.34	2.17	2.18	2.35	2.45	2.68	2.96	3.14	3.45	3.64	3.39	3.15	2.97	2.86	2.74	
SD	1.13	1.08	1.12	1.11	1.04	1.05	1.07	1.06	1.04	1.04	1.01	0.82	0.79	0.76	0.78	0.92	0.89	0.98	0.91	0.82	0.74	0.83	0.83	1.05		
PK	5.28	5.07	5.12	5.14	4.95	4.64	4.49	4.17	4.93	4.79	4.35	4.14	3.97	4.02	4.38	4.91	4.70	4.98	4.93	5.01	4.67	4.91	4.68	4.95		5.28

OU000 [Program: edms\_monthsum

Version: LC:12-MAY-92]

TABLE 3-4. Average wind speed summary for July 1992.



PROJECT, #206018

SITE 1 UPRR

AUGUST, 1992

AEROVIRONMENT INC.

\*\*\*\*\*  
 \* FINAL DATA \*  
 \* AS OF 25/AUG/92 \*  
 \*\*\*\*\*

CLOCK HOUR [LOCAL STANDARD TIME]

DY	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVG	PEAK	
1	2.81	2.88	2.63	2.97	2.61	2.09	1.79	1.83	2.50	1.74	1.14	1.32	1.29	1.28	0.80	1.17	1.61	1.72	1.53	2.72	2.98	3.38	2.54	2.03	2.06	3.38	
2	1.81	1.77	1.58	0.67	1.64	1.44	1.55	1.49	2.18	1.87	1.30	1.18	1.34	1.40	1.54	1.54	2.34	2.43	3.75	4.15	3.84	3.04	2.61	2.68	2.05	4.15	
3	2.67	2.42	2.59	2.40	2.62	2.90	2.78	2.53	2.79	3.02	2.27	1.48	1.34	1.20	1.44	2.04	2.52	3.65	3.87	3.42	3.47	3.23	2.74	2.10	2.56	3.87	
4	1.74	1.41	1.56	1.13	1.56	1.72	1.98	2.52	3.23	3.07	2.52	2.20	1.56	2.14	2.40	2.69	3.36	4.11	4.20	4.18	3.63	3.34	2.91	3.02	2.59	4.20	
5	3.16	3.38	3.53	3.16	2.90	2.72	2.97	2.94	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	3.09	3.53
6	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
7	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
8	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
9	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
10	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
11	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
12	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
13	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
14	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
15	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
16	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
17	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
18	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
19	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
20	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
21	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
22	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
23	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
24	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
25	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
26	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
27	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
28	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
29	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
30	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
31	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
AV	2.44	2.37	2.38	2.07	2.27	2.17	2.21	2.26	2.68	2.43	1.81	1.54	1.38	1.50	1.54	1.86	2.46	2.98	3.34	3.62	3.48	3.25	2.70	2.46	2.47		
SD	0.63	0.80	0.83	1.11	0.62	0.63	0.63	0.59	0.44	0.72	0.69	0.45	0.12	0.43	0.66	0.66	0.72	1.10	1.22	0.69	0.37	0.15	0.16	0.48			
PK	3.16	3.38	3.53	3.16	2.90	2.90	2.97	2.94	3.23	3.07	2.52	2.20	1.56	2.14	2.40	2.69	3.36	4.11	4.20	4.18	3.84	3.38	2.91	3.02	4.20		

OU000 [Program: edms\_monthsum

Version: LC:12-MAY-92]

TABLE 3-5. Average wind speed summary for August 1992.



PROJECT, #206018

SITE 1 UPRR

JULY, 1992

AEROVIRONMENT INC.

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 \*  
 \* FINAL DATA \*  
 \* AS OF 25/AUG/92 \*  
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 \*\*\*\*\*

CLOCK HOUR [LOCAL STANDARD TIME]

DY	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	PREV
1	277	306	48	149	166	205	227	102	158	168	153	253	245	259	244	270	238	198	246	213	223	216	220	233	[VA]
2	228	158	160	153	158	165	162	163	187	211	194	197	194	237	241	244	273	237	239	269	199	208	213	197	[VA]
3	177	136	146	164	141	143	167	170	186	175	161	194	215	244	226	224	231	235	218	226	215	224	224	220	[VA]
4	209	197	198	195	189	188	189	184	198	212	199	205	204	207	205	196	213	215	212	209	216	205	194	194	10
5	176	150	146	135	130	137	140	148	162	166	176	187	177	240	227	206	257	241	229	226	212	192	189	189	[VA]
6	178	140	137	143	146	151	154	158	167	176	179	200	202	218	199	172	190	191	189	208	205	203	191	192	10
7	177	151	152	162	172	194	132	115	174	300	272	347	344	354	319	291	245	322	286	304	285	57	251	92	[VA]
8	132	148	127	159	149	139	111	80	143	127	95	107	118	9	299	240	291	236	266	233	243	241	229	219	[VA]
9	209	132	134	163	168	153	134	127	177	211	173	195	254	240	259	260	231	223	241	233	227	214	213	215	10
10	156	158	153	157	160	141	153	136	168	186	195	196	229	221	214	222	222	222	227	226	229	221	205	189	[VA]
11	196	195	200	195	192	191	190	196	194	194	206	217	212	206	219	231	234	247	232	232	244	221	208	202	10
12	199	196	208	202	192	189	186	146	182	201	198	205	214	210	214	203	209	227	244	245	242	253	241	240	[VA]
13	238	234	238	255	99	157	185	161	189	184	171	196	220	209	229	225	216	246	210	214	222	218	226	207	11
14	154	163	173	172	180	179	171	182	184	190	188	200	197	218	228	217	210	191	196	207	222	191	186	192	9
15	171	173	144	182	183	186	172	183	196	173	183	187	184	203	209	229	213	209	203	203	199	196	195	171	9
16	172	175	185	180	176	169	174	174	195	193	213	229	213	237	254	231	220	213	219	232	217	185	193	196	9
17	164	174	187	197	193	177	169	170	183	192	205	211	205	209	217	207	218	221	218	213	207	202	196	193	10
18	194	196	192	181	180	182	175	187	198	200	189	202	217	230	218	230	209	206	223	217	207	197	187	184	10
19	178	170	169	165	162	162	164	172	180	186	187	191	197	221	221	233	208	208	210	213	213	216	194	191	9
20	181	179	183	187	189	189	186	183	196	205	211	263	282	334	257	236	236	206	199	205	200	200	207	201	10
21	177	159	152	154	159	149	151	153	175	185	178	179	211	242	245	215	212	221	218	213	200	201	200	175	8
22	170	160	165	170	174	176	174	185	186	185	185	192	186	207	227	229	291	281	218	222	229	228	228	210	[VA]
23	180	150	151	168	175	154	61	99	254	132	153	209	280	313	316	307	301	237	216	219	227	229	230	229	[VA]
24	182	150	169	178	172	171	181	158	186	198	192	196	195	239	246	233	240	223	220	212	223	213	212	202	10
25	158	151	147	171	157	181	191	200	195	191	201	211	243	232	217	218	229	216	203	204	203	201	193	170	10
26	171	183	175	181	181	176	188	187	184	179	191	214	245	255	254	241	228	247	218	214	206	215	214	223	[VA]
27	165	161	170	178	177	165	185	186	170	167	205	4	298	334	313	320	309	254	229	194	195	199	202	213	9
28	172	154	167	169	175	177	180	180	192	194	238	191	231	230	233	206	212	202	207	199	203	201	193	177	10
29	166	164	163	163	169	182	189	187	184	191	204	220	214	211	200	199	208	204	197	197	195	193	189	179	10
30	183	185	183	179	186	185	184	190	185	193	207	212	209	215	215	223	218	223	217	210	198	196	196	199	9
31	175	170	185	184	185	185	166	161	178	190	195	241	256	262	265	256	229	230	222	211	197	194	195	196	9
PV	9	8	8	9	9	9	9	9	9	10	10	10	10	10	10	11	11	11	11	11	10	10	10	10	10

00001 [Program: EDMS\_MONTHSUM

Version: LC:12-MAY-92]

TABLE 3-6. Average wind direction summary (degrees compass) for July 1992.

PROJECT, #206018

SITE 1 UPRR

AUGUST, 1992

AEROVIRONMENT INC.

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\*  
\* FINAL DATA \*  
\* AS OF 25/AUG/92 \*  
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\*\*\*\*\*

CLOCK HOUR [LOCAL STANDARD TIME]

DY	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	PREV
1	169	165	168	163	161	158	146	158	167	188	178	185	320	214	215	260	261	249	217	221	202	195	198	182	8
2	144	145	145	150	160	155	153	161	179	162	194	214	239	239	257	251	209	221	205	190	190	185	177	162	8
3	162	167	174	173	167	170	172	168	170	185	176	197	223	256	241	217	214	206	205	209	193	186	185	148	9
4	138	146	143	150	151	154	153	168	174	175	178	227	172	224	216	213	216	217	229	219	204	187	181	168	[VA]
5	173	172	171	176	179	175	185	188	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	9
6	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
7	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
8	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
9	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
10	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
11	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
12	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
13	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
14	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
15	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
16	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
17	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
18	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
19	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
20	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
21	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
22	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
23	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
24	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
25	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
26	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
27	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
28	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
29	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
30	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
31	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
PV	7	7	[VA]	8	8	8	8	8	9	9	9	[VA]	[VA]	11	11	10	11	11	10	[VA]	10	9	9	8	

OU001 [Program: EDMS\_MONTHSUM

Version: LC:12-MAY-92]

TABLE 3-7. Average wind direction summary (degrees compass) for August 1992.



PROJECT, #206018

SITE 1 UPRR

JULY, 1992

AEROVIRONMENT INC.

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*****
*
* FINAL DATA
* AS OF 25/AUG/92
*
*****

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CLOCK HOUR (LOCAL STANDARD TIME)

DY	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	PREV
1	W	NW	NE	SSE	SSE	SSW	SW	ESE	SSE	SSE	SSE	WSW	WSW	W	WSW	W	WSW	SSW	WSW	SSW	SW	SW	SW	SW	[VA]
2	SW	SSE	SSE	SSE	SSE	SSE	SSE	SSE	S	SSW	SSW	SSW	SSW	WSW	WSW	W	WSW	WSW	W	SSW	SSW	SSW	SSW	SSW	[VA]
3	S	SE	SSE	SSE	SE	SE	SSE	S	S	S	SSE	SSW	SW	WSW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	[VA]
4	SSW	SSW	SSW	SSW	S	S	S	S	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW
5	S	SSE	SE	SE	SE	SE	SE	SSE	SSE	SSE	S	S	S	WSW	SW	SSW	WSW	WSW	SW	SSW	SSW	S	S	[VA]	
6	S	SE	SE	SE	SE	SSE	SSE	SSE	S	S	SSW	SSW	SW	SSW	S	S	SSW	S	SSW	S	SSW	SSW	S	SSW	SSW
7	S	SSE	SSE	SSE	S	SSW	SE	ESE	S	WNW	W	NNW	NNW	N	NW	WNW	WSW	NW	WNW	ENE	WSW	E	[VA]		
8	SE	SSE	SE	SSE	SSE	SE	ESE	E	SE	SE	E	ESE	ESE	N	WNW	WSW	WNW	SW	W	SW	WSW	WSW	SW	SW	[VA]
9	SSW	SE	SE	SSE	SSE	SSE	SE	SE	S	SSW	S	SSW	WSW	WSW	W	SW	SW	WSW	SW	SW	SSW	SSW	SW	SSW	
10	SSE	SSE	SSE	SSE	SSE	SE	SSE	SE	SSE	S	SSW	SSW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SSW	S	[VA]
11	SSW	SSW	SSW	SSW	SSW	S	S	SSW	SSW	SSW	SSW	SW	SSW	SSW	SW	SW	SW	WSW	SW	SW	WSW	SW	SSW	SSW	SSW
12	SSW	SSW	SSW	SSW	SSW	S	S	SE	S	SSW	SSW	SW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	[VA]
13	WSW	SW	WSW	WSW	E	SSE	S	SSE	S	S	S	SSW	SW	SSW	SW	SW	SW	WSW	SSW	SSW	SSW	SW	SW	SSW	SSW
14	SSE	SSE	S	S	S	S	S	S	S	S	S	SSW	SSW	SW	SW	SW	SSW	SSW	SSW	SSW	SSW	SSW	S	S	SSW
15	S	S	SE	S	S	S	S	S	S	SSW	S	S	S	S	SSW	SSW	SW	SSW	SSW	SSW	SSW	SSW	SSW	S	S
16	S	S	S	S	S	S	S	S	S	SSW	SSW	SSW	WSW	WSW	SW	SW	SW	SSW	SSW	SSW	SSW	SSW	S	SSW	SSW
17	SSW	S	S	SSW	SSW	S	SSE	S	S	SSW	SSW	SSW	SSW	SSW	SW	SSW	SW	SW	SSW	SSW	SSW	SSW	SSW	SSW	SSW
18	SSW	SSW	SSW	S	S	S	S	S	SSW	SSW	S	SSW	SW	SW	SW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	S	S	SSW
19	S	S	SSE	SSE	SSE	SSE	SSE	S	S	S	S	S	SSW	SW	SW	SW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	S	S
20	S	S	S	S	S	S	S	S	SSW	SSW	SSW	W	WNW	NNW	WSW	WSW	SW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW
21	S	SSE	SSE	SSE	SSE	SSE	SSE	SSE	S	S	S	S	SSW	WSW	WSW	SW	SSW	SW	SW	SSW	SSW	SSW	SSW	S	SSE
22	S	SSE	SSE	S	S	S	S	S	S	S	S	SSW	S	SSW	SW	WNW	W	SW	SW	SW	SW	SW	SW	SSW	[VA]
23	S	SSE	SSE	SSE	S	SSE	ENE	E	WSW	SE	SSE	SSW	W	NW	NW	WNW	WSW	SW	SW	SW	SW	SW	SW	SW	[VA]
24	S	SSE	S	S	S	S	S	SSE	S	SSW	SSW	SSW	SSW	WSW	WSW	SW	WSW	SW	SW	SSW	SW	SSW	SSW	SSW	SSW
25	SSE	SSE	SSE	S	SSE	S	S	SSW	SSW	SSW	SSW	SSW	WSW	SW	SW	SW	SW	SSW	SSW	SSW	SSW	SSW	SSW	S	SSW
26	S	S	S	S	S	S	S	S	S	S	S	S	SW	WSW	WSW	WSW	WSW	SW	WSW	SW	SSW	SSW	SW	SW	[VA]
27	SSE	SSE	S	S	S	SSE	S	S	S	SSE	SSW	N	WNW	NNW	NW	NW	NW	WSW	SW	SSW	SSW	SSW	SSW	SSW	S
28	S	SSE	SSE	S	S	S	S	S	S	SSW	SSW	WSW	S	SW	SW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	S	SSW
29	SSE	SSE	SSE	SSE	S	S	S	S	S	S	S	SSW	SW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	S	S	SSW
30	S	S	S	S	S	S	S	S	S	SSW	SSW	SSW	SSW	SW	SW	SW	SW	SW	SSW	SSW	SSW	SSW	SSW	SSW	S
31	S	S	S	S	S	S	SSE	SSE	S	S	SSW	WSW	WSW	W	W	WSW	SW	SW	SW	SSW	SSW	SSW	SSW	SSW	S
PV	S	SSE	SSE	S	S	S	S	S	S	SSW	SSW	SSW	SSW	SSW	SW	SW	SW	SW	SW	SSW	SSW	SSW	SSW	SSW	

00004 [Program: EDMS\_MONTHSUM

Version: LC:12-MAY-92]

TABLE 3-8. Average wind direction summary (prevailing direction) for July 1992.



PROJECT, #206018  
 SITE 1 UPRR  
 AUGUST, 1992  
 AEROVIRONMENT INC.

\*\*\*\*\*  
 \* FINAL DATA \*  
 \* AS OF 25/AUG/92 \*  
 \*\*\*\*\*

CLOCK HOUR [LOCAL STANDARD TIME]

DY	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	PREV
1	SSE	SSE	SSE	SSE	SSE	SSE	SE	SSE	SSE	S	S	S	NW	SW	SW	W	W	WSW	SW	SW	SSW	SSW	SSW	S	SSE
2	SE	SE	SE	SSE	SSE	SSE	SSE	SSE	S	SSE	SSW	SW	WSW	WSW	WSW	WSW	SSW	SW	SSW	S	S	S	S	SSE	SSE
3	SSE	SSE	S	S	SSE	S	S	SSE	S	S	S	SSW	SW	WSW	WSW	SW	SSW	SSW	SSW	SSW	S	S	S	SSE	S
4	SE	SE	SE	SSE	SSE	SSE	SSE	SSE	S	S	S	SW	S	SW	SW	SSW	SW	SW	SW	SW	SSW	S	S	SSE	[VA]
5	S	S	S	S	S	S	S	S	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	S
6	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
7	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
8	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
9	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
10	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
11	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
12	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
13	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
14	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
15	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
16	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
17	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
18	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
19	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
20	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
21	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
22	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
23	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
24	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
25	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
26	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
27	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
28	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
29	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
30	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
31	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
PV	SE	SE [VA]	SSE	SSE	SSE	SSE	SSE	SSE	S	S	S [VA]	[VA]	SW	SW	SSW	SW	SW	SSW	[VA]	SSW	S	S	SSE		

2.12

OU004 [Program: EDMS\_MONTHSUM

Version: LC:12-MAY-92]

TABLE 3-9. Average wind direction summary (prevailing direction) for August 1992.



PROJECT, #206018

SITE 1 UPRR

JULY, 1992

AEROVIRONMENT INC.

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\*  
\* FINAL DATA \*  
\* AS OF 25/AUG/92 \*  
\*  
\*\*\*\*\*

CLOCK HOUR [LOCAL STANDARD TIME]

DY	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVG	PEAK
1	23.4	33.1	70.3	73.8	28.0	24.6	18.7	61.9	30.7	58.2	88.9	75.7	75.2	84.0	78.3	77.7	49.5	37.9	66.6	27.2	15.9	16.6	15.1	16.3	47.8	88.9
2	18.7	27.8	8.8	12.8	9.0	8.5	9.4	10.8	17.2	22.0	32.4	40.3	30.6	46.7	61.5	64.2	65.8	62.0	37.3	34.4	20.4	15.5	17.8	14.6	28.7	65.8
3	12.7	17.5	12.8	12.4	16.7	12.2	11.3	15.1	11.2	20.6	35.2	51.2	69.7	54.0	70.1	32.7	24.7	21.8	18.5	17.0	16.2	15.7	17.1	17.4	25.2	70.1
4	15.2	12.0	12.5	12.8	11.0	10.5	11.1	10.8	15.5	17.5	19.1	22.8	20.4	24.4	20.5	20.7	25.5	33.7	22.7	18.1	17.3	14.9	13.4	11.8	17.3	33.7
5	13.2	14.6	12.7	13.7	12.3	12.3	12.5	14.0	14.2	22.6	28.9	50.4	53.5	43.1	52.3	64.8	59.5	46.4	31.1	22.5	20.6	9.4	9.3	11.1	26.9	64.8
6	22.6	17.8	11.5	12.7	10.2	11.9	8.9	12.4	13.1	22.3	30.3	38.9	38.9	36.1	45.1	36.4	27.6	19.2	13.9	18.8	15.0	16.7	9.8	9.8	20.8	45.1
7	13.4	14.4	13.9	18.5	11.9	26.5	72.3	28.0	72.2	46.5	66.4	45.9	34.2	27.4	52.3	50.0	81.4	63.4	35.6	22.3	14.5	60.8	46.5	57.7	40.7	81.4
8	77.9	17.9	17.6	15.6	24.9	22.7	40.5	59.6	35.3	35.2	51.4	72.9	66.2	84.0	53.3	73.0	63.1	39.6	40.7	24.9	17.1	18.1	16.0	15.1	40.9	84.0
9	18.0	52.5	26.0	18.4	11.1	20.1	21.3	20.9	24.3	28.9	56.7	43.5	35.6	54.8	52.3	40.7	33.0	24.3	25.0	18.2	18.4	14.9	16.4	19.7	29.0	56.7
10	28.2	13.0	12.9	12.8	13.8	15.6	16.0	14.6	18.3	13.9	20.4	14.9	21.4	22.5	18.9	19.1	18.1	17.9	22.1	17.6	15.9	17.1	15.7	10.2	17.1	28.2
11	11.6	12.0	12.6	13.7	15.4	11.1	10.7	11.1	12.5	12.6	15.0	17.6	22.4	20.8	22.9	23.0	21.9	24.7	20.2	19.4	20.4	19.5	17.8	20.1	17.0	24.7
12	13.7	13.6	16.0	14.8	13.4	12.0	13.1	26.2	28.0	22.4	21.1	27.7	66.3	46.3	63.1	57.3	48.0	35.6	38.5	37.9	21.4	18.8	19.5	17.7	28.9	66.3
13	18.2	16.9	18.5	56.1	61.5	23.3	15.5	13.6	14.1	17.1	27.5	31.9	38.9	30.5	28.1	25.3	32.9	36.8	23.9	17.5	17.0	17.4	16.7	16.9	25.7	61.5
14	29.1	11.3	8.6	11.9	14.8	14.0	11.1	15.6	14.9	17.2	22.0	27.9	34.2	40.3	35.5	23.6	21.2	18.1	14.2	16.5	17.4	23.6	9.8	13.1	19.4	40.3
15	31.4	15.6	14.8	15.9	12.5	13.9	11.2	12.5	12.6	23.3	23.3	32.2	31.6	34.5	30.8	24.7	21.0	21.4	17.5	15.7	14.2	12.7	12.4	15.9	19.7	34.5
16	13.5	13.9	15.2	13.0	15.2	13.6	13.1	15.0	13.0	21.2	28.6	42.5	44.4	65.0	49.3	31.4	26.1	21.6	18.2	21.1	18.7	13.9	13.8	12.0	23.1	65.0
17	20.1	16.0	12.0	13.3	15.6	13.4	14.6	11.4	12.0	12.9	15.2	18.3	19.3	19.4	25.7	19.8	18.9	16.8	16.5	16.2	17.0	13.7	12.5	11.4	15.9	25.7
18	11.3	11.7	12.1	10.4	10.6	11.1	10.3	10.5	13.8	18.1	21.3	48.0	62.9	54.7	58.2	35.3	21.2	20.9	18.1	16.9	18.9	12.8	11.5	10.3	22.1	62.9
19	12.3	10.2	11.2	9.7	11.5	9.8	8.9	9.3	12.8	13.5	16.8	18.5	18.6	20.5	23.5	23.5	19.3	15.8	15.8	15.3	17.0	16.4	16.4	10.2	14.9	23.5
20	11.6	10.2	10.4	10.1	9.8	10.8	10.6	12.2	12.6	18.0	25.6	40.6	54.5	48.2	76.1	60.6	49.0	32.7	18.6	15.0	13.1	13.6	16.0	13.0	24.7	76.1
21	16.6	10.5	10.7	10.7	10.2	12.1	10.7	10.2	18.0	18.4	21.2	23.3	36.7	42.4	31.9	23.4	20.3	20.5	16.6	15.0	13.1	14.2	15.3	12.5	18.1	42.4
22	10.4	10.4	9.8	10.3	9.4	11.6	10.6	11.3	11.3	12.1	16.4	42.3	47.5	72.3	72.7	44.5	62.2	52.9	45.9	17.4	17.6	18.5	17.8	18.1	27.2	72.7
23	28.1	13.4	14.2	15.2	13.9	17.5	72.2	65.3	80.8	94.0	54.3	72.7	71.5	50.0	39.6	56.2	43.0	45.9	29.8	18.5	15.6	15.4	16.8	15.9	40.0	94.0
24	40.9	11.5	15.3	9.2	15.5	16.5	16.5	11.9	14.2	25.3	26.8	57.5	83.9	61.4	52.2	56.4	52.4	43.5	30.5	21.7	15.3	16.8	16.3	21.2	30.5	83.9
25	15.4	14.2	15.7	16.2	22.7	10.2	12.1	15.2	17.0	25.9	35.6	32.0	31.1	32.8	31.2	30.0	26.9	20.2	20.2	14.9	14.1	13.4	13.9	16.5	20.7	35.6
26	14.1	12.4	13.3	13.9	12.6	10.6	10.2	12.0	14.4	19.2	31.5	45.9	39.1	41.7	42.1	40.7	39.7	29.4	22.3	16.0	16.9	21.4	19.2	18.7	23.2	45.9
27	41.1	11.4	9.4	9.2	18.7	11.9	15.9	19.9	26.5	44.8	57.5	93.4	59.3	36.5	51.7	47.3	42.7	34.9	23.5	16.3	9.4	14.8	16.7	17.1	30.4	93.4
28	43.4	16.6	15.3	11.0	14.1	15.8	15.9	14.7	14.6	24.4	56.3	46.8	43.4	38.0	48.2	26.1	22.9	20.0	17.0	13.5	13.7	12.7	11.6	12.8	23.7	56.3
29	11.1	9.8	13.6	10.5	11.2	11.9	10.5	12.8	12.7	13.2	25.1	30.0	44.6	41.4	28.9	21.4	20.9	18.0	14.5	12.2	11.3	11.9	11.2	10.9	17.5	44.6
30	11.2	10.8	11.6	11.4	10.9	10.4	9.3	10.9	10.6	16.4	18.7	18.3	23.7	28.5	24.0	24.9	22.6	20.8	19.9	18.6	15.1	11.6	11.7	12.2	16.0	28.5
31	15.6	10.6	9.8	10.7	11.1	10.8	14.3	10.0	19.3	30.0	36.8	56.2	48.6	48.5	61.2	41.8	41.7	26.1	17.5	13.9	13.0	11.1	11.2	24.6	61.2	
AV	21.4	15.6	15.1	16.2	15.5	14.1	17.4	18.7	20.6	25.1	32.9	40.7	44.4	43.6	44.8	39.9	36.2	30.9	25.2	19.2	16.2	17.0	15.7	15.8	25.1	
SD	14.1	8.5	10.8	13.4	9.6	4.7	15.8	15.2	16.2	16.6	17.7	18.9	18.3	17.1	17.2	17.7	17.2	13.4	11.4	5.6	2.7	8.7	6.4	8.4		
PK	77.9	52.5	70.3	73.8	61.5	26.5	72.3	65.3	80.8	94.0	88.9	93.4	83.9	84.0	78.3	77.7	81.4	63.4	66.6	37.9	21.4	60.8	46.5	57.7		94.0

OU000 [Program: edms\_monthsum

Version: LC:12-MAY-92)

TABLE 3-10. Standard deviation summary (Sigma Theta) for July 1992.



PROJECT, #206018

SITE 1 UPRR

AUGUST, 1992

AEROVIRONMENT INC.

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\*  
\* FINAL DATA \*  
\* AS OF 25/AUG/92 \*  
\*  
\*\*\*\*\*

CLOCK HOUR [LOCAL STANDARD TIME]

DY	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVG	PEAK
1	16.5	10.8	11.8	10.5	11.6	13.1	15.2	26.6	16.7	44.3	57.6	68.1	68.0	59.0	57.3	82.9	64.3	44.0	38.5	18.4	12.9	11.3	12.9	23.3	33.1	82.9
2	16.8	12.8	12.6	15.0	8.5	16.7	13.6	16.6	14.9	20.2	43.3	67.0	49.2	60.0	47.8	61.7	30.1	25.9	17.4	11.5	11.5	13.9	14.7	23.4	26.0	67.0
3	10.7	11.9	10.6	13.0	9.5	9.1	8.3	14.0	17.8	14.6	23.7	51.8	59.3	67.3	64.2	38.7	28.5	20.3	16.0	16.5	11.3	11.6	17.9	15.1	23.4	67.3
4	12.1	12.6	9.9	14.0	12.9	11.4	13.7	10.8	13.5	14.1	26.3	36.7	45.8	40.0	34.3	29.0	24.9	17.9	19.9	18.6	16.8	16.6	12.9	11.9	19.9	45.8
5	8.9	11.3	10.7	9.4	9.9	11.2	12.3	10.2	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	10.5 12.3
6	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
7	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
8	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
9	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
10	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
11	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
12	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
13	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
14	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
15	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
16	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
17	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
18	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
19	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
20	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
21	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
22	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
23	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
24	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
25	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
26	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
27	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
28	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
29	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
30	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
31	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
AV	13.0	11.9	11.1	12.4	10.5	12.3	12.6	15.6	15.8	23.3	37.7	55.9	55.6	56.6	50.9	53.1	36.9	27.0	22.9	16.3	13.1	13.3	14.6	18.4	22.6	
SD	3.5	0.8	1.1	2.4	1.8	2.9	2.6	6.6	1.9	14.3	15.8	14.8	10.1	11.6	13.0	24.2	18.3	11.8	10.5	3.3	2.5	2.5	2.3	5.8		
PK	16.8	12.8	12.6	15.0	12.9	16.7	15.2	26.6	17.8	44.3	57.6	68.1	68.0	67.3	64.2	82.9	64.3	44.0	38.5	18.6	16.8	16.6	17.9	23.4		82.9

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OU000 [Program: edms\_monthsum

Version: LC:12-MAY-92]

TABLE 3-11. Standard deviation summary (Sigma Theta) for August 1992.



PROJECT, #206018

SITE 1 UPRR

JULY, 1992

ARROVIRONMENT INC.

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\*  
\* FINAL DATA \*  
\* AS OF 25/AUG/92 \*  
\*  
\*\*\*\*\*

CLOCK HOUR [LOCAL STANDARD TIME]

DY	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVG	PEAK
1	17.2	15.9	15.4	15.3	14.9	14.5	14.2	14.7	16.4	18.3	20.3	22.1	23.6	24.8	25.7	27.1	27.4	27.8	28.2	27.5	25.6	23.6	21.2	19.5	20.9	28.2
2	18.4	17.6	16.9	16.4	15.9	15.6	15.4	15.5	16.4	18.2	20.7	23.4	25.5	27.2	28.7	29.7	30.3	30.5	30.9	30.8	29.6	26.7	24.1	22.2	22.8	30.9
3	20.4	19.2	18.9	18.8	18.0	17.6	17.3	16.9	17.2	18.8	21.4	23.4	25.8	28.1	29.9	30.8	31.0	30.9	30.0	27.9	24.2	21.0	18.9	17.5	22.7	31.0
4	17.0	16.7	16.6	16.1	15.8	15.5	15.4	15.4	16.6	18.2	19.3	20.5	22.1	23.1	23.8	24.5	25.1	25.5	25.7	25.2	23.6	21.5	19.4	17.7	20.0	25.7
5	16.8	16.3	15.8	15.1	14.3	14.1	14.0	14.3	15.6	17.0	19.2	21.3	23.0	24.6	26.1	27.2	28.5	29.1	29.0	28.1	26.7	23.9	21.5	19.8	20.9	29.1
6	18.9	18.2	17.3	16.8	16.4	16.1	16.1	16.1	16.7	18.2	20.4	22.6	24.1	25.3	25.9	27.3	28.5	29.0	28.4	27.4	25.3	22.7	20.3	18.6	21.5	29.0
7	17.6	17.3	16.7	16.2	15.8	15.2	14.7	14.8	16.6	18.9	20.7	23.0	25.3	27.4	29.2	30.5	31.5	31.9	32.4	32.3	31.6	28.0	25.7	23.3	23.2	32.4
8	21.6	20.8	19.7	19.1	18.6	17.5	16.8	16.9	19.8	22.1	25.1	28.2	30.6	32.5	33.8	34.8	35.2	35.7	35.7	35.4	34.4	31.1	28.8	26.9	26.7	35.7
9	25.2	23.3	21.9	21.3	20.9	20.8	19.7	20.2	22.3	23.9	26.7	29.0	31.6	33.3	34.8	35.4	35.8	35.6	35.0	33.9	32.0	29.7	27.2	25.5	27.7	35.8
10	24.3	23.5	23.0	22.5	22.0	21.4	21.2	20.8	22.8	24.5	26.9	28.3	30.6	32.3	33.4	33.4	33.0	33.1	31.6	30.1	28.6	27.0	24.7	23.0	26.8	33.4
11	21.0	19.7	18.8	18.3	18.0	17.7	17.4	17.6	18.4	19.1	20.3	22.6	24.4	25.7	26.8	27.4	27.8	27.0	26.9	25.6	23.8	22.4	20.7	19.1	21.9	27.8
12	18.3	17.8	17.4	16.9	16.6	16.3	16.0	15.9	16.7	17.6	19.6	20.8	22.4	23.9	24.9	27.1	27.8	28.5	28.8	28.8	28.2	26.1	24.7	23.8	21.9	28.8
13	23.1	22.0	20.9	19.9	19.8	20.0	19.6	19.3	19.8	21.0	23.5	26.2	28.6	29.9	30.8	31.8	32.4	32.8	32.7	31.2	29.0	26.9	24.8	23.6	25.4	32.8
14	22.4	21.5	20.8	20.2	19.6	18.9	18.5	18.4	19.2	20.6	22.3	24.8	27.4	29.9	31.8	32.9	33.7	33.9	33.8	32.4	30.6	28.5	25.9	24.1	25.5	33.9
15	23.3	22.3	21.8	21.7	20.3	19.1	18.2	18.0	18.4	20.2	22.2	24.7	27.3	29.8	31.6	33.3	34.1	34.2	33.3	31.6	29.0	25.9	23.6	22.3	25.3	34.2
16	21.5	20.6	19.6	18.7	18.4	17.7	17.0	17.0	17.9	19.6	22.0	24.6	27.4	29.9	32.5	33.7	34.8	35.3	34.0	32.8	31.8	28.0	25.5	23.4	25.2	35.3
17	21.6	20.8	20.0	19.1	18.0	17.5	17.1	17.0	17.6	19.3	21.4	23.6	25.7	27.7	30.0	32.1	32.7	32.7	32.0	29.5	26.9	23.3	20.5	18.8	23.5	32.7
18	17.7	17.3	17.0	16.7	16.6	16.4	16.2	16.2	17.5	19.1	20.8	23.0	25.2	27.5	29.4	30.8	31.8	32.5	32.3	30.6	28.3	25.1	22.7	21.3	23.0	32.5
19	19.9	19.1	18.4	17.7	17.3	17.0	16.5	16.6	17.8	19.5	21.4	23.5	26.0	27.8	29.2	30.4	31.5	31.2	29.5	27.5	24.7	21.6	19.3	17.7	22.5	31.5
20	17.1	16.9	16.7	16.5	16.3	16.1	15.9	16.0	17.0	18.9	20.8	22.3	24.3	26.1	27.5	28.9	30.2	31.0	31.1	29.9	27.8	25.5	22.8	21.1	22.4	31.1
21	19.5	18.7	18.4	17.7	17.2	16.6	16.2	16.1	16.9	18.5	20.6	23.2	25.5	27.7	29.4	30.9	32.1	32.1	30.9	28.4	26.1	23.8	21.7	20.1	22.8	32.1
22	18.8	18.3	17.7	17.1	16.5	15.9	15.7	15.9	16.7	18.3	20.3	22.4	24.4	26.3	27.6	29.0	30.0	30.8	30.4	29.1	27.3	24.6	22.4	21.1	22.4	30.8
23	20.0	19.0	18.6	18.0	17.3	16.5	16.0	16.4	18.3	20.5	22.1	24.0	26.2	27.7	29.6	31.0	32.0	32.4	32.5	31.4	28.7	26.2	24.3	22.2	23.8	32.5
24	20.8	20.1	19.4	18.4	17.6	16.6	16.1	16.0	16.9	18.5	20.8	23.5	26.2	28.6	30.8	32.3	33.3	33.8	33.8	33.3	30.7	26.4	24.0	22.4	24.2	33.8
25	20.6	20.5	20.0	19.7	19.1	18.0	16.9	16.3	16.9	18.6	21.0	23.9	26.2	28.7	30.3	31.6	32.6	33.0	32.9	31.5	29.1	26.3	23.8	21.7	24.1	33.0
26	20.3	19.7	19.1	18.3	17.0	16.2	15.6	15.2	15.9	17.7	20.0	22.8	26.0	29.0	31.1	33.2	34.5	35.4	35.6	34.2	31.5	28.5	26.0	24.2	24.4	35.6
27	22.6	21.4	20.6	20.0	19.1	18.5	18.3	17.9	18.6	20.6	23.6	27.0	30.0	32.4	34.2	36.1	37.2	38.0	37.7	37.0	35.3	31.2	28.0	25.9	27.1	38.0
28	24.1	22.9	22.4	21.8	21.3	20.4	19.1	18.6	19.2	21.0	23.7	26.8	30.1	33.0	35.5	36.7	37.1	37.5	36.7	34.1	30.0	26.9	24.1	22.0	26.9	37.5
29	20.9	20.7	20.3	19.7	18.6	17.4	15.9	14.7	15.2	17.0	19.9	23.1	26.3	28.8	30.4	32.2	33.8	34.2	33.2	30.9	27.7	23.9	21.0	19.2	23.5	34.2
30	18.5	17.7	16.9	15.8	14.6	14.1	13.9	13.9	14.9	17.0	19.2	21.4	23.6	25.4	27.3	28.7	30.3	30.5	30.2	28.5	25.7	22.1	19.1	17.2	21.1	30.5
31	16.0	15.2	14.3	13.6	13.4	13.0	13.0	13.1	14.0	15.5	17.5	19.7	22.6	25.6	28.1	30.2	31.6	32.6	32.5	31.2	28.3	24.1	21.2	19.5	21.1	32.6
AV	20.2	19.4	18.7	18.2	17.6	17.0	16.6	16.5	17.5	19.2	21.4	23.7	26.1	28.1	29.7	31.0	31.9	32.2	31.9	30.6	28.5	25.6	23.2	21.4	23.6	
SD	2.4	2.2	2.2	2.1	2.1	2.0	1.8	1.7	1.9	1.9	2.1	2.3	2.5	2.7	3.0	2.9	2.9	2.9	2.8	2.8	2.9	2.7	2.7	2.6		
PK	25.2	23.5	23.0	22.5	22.0	21.4	21.2	20.8	22.8	24.5	26.9	29.0	31.6	33.3	35.5	36.7	37.2	38.0	37.7	37.0	35.3	31.2	28.8	26.9		38.0

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TABLE 3-12. Temperature summary for July 1992.



PROJECT, #206018  
SITE 1 UPRR  
AUGUST, 1992  
AEROVIRONMENT INC.

\*\*\*\*\*  
\* FINAL DATA \*  
\* AS OF 25/AUG/92 \*  
\*\*\*\*\*

CLOCK HOUR [LOCAL STANDARD TIME]

DY	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVG	PEAK
1	18.3	17.9	17.1	16.4	15.8	15.2	14.8	14.7	15.4	16.9	18.8	21.3	24.1	26.6	29.1	31.6	33.8	34.8	35.3	34.1	31.7	27.8	24.6	22.5	23.3	35.3
2	21.0	20.5	20.0	19.7	19.3	18.7	18.0	17.6	18.5	20.5	22.3	24.9	27.5	30.2	33.1	35.0	35.9	36.6	36.1	34.1	31.5	27.2	23.8	22.3	25.6	36.6
3	20.1	18.7	18.2	17.3	16.4	16.1	15.7	15.6	16.5	18.2	20.5	23.8	26.9	29.6	32.1	33.8	35.2	35.7	35.0	33.2	29.6	25.3	22.8	21.4	24.1	35.7
4	20.4	19.4	18.7	18.1	17.5	17.0	16.4	16.4	17.3	18.8	21.0	25.8	28.7	29.6	31.9	33.4	34.5	34.7	33.3	31.1	28.4	25.2	22.8	21.0	24.2	34.7
5	20.2	19.5	18.9	18.0	17.3	16.6	15.8	15.3	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	17.7 20.2
6	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
7	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
8	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
9	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
10	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
11	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
12	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
13	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
14	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
15	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
16	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
17	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
18	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
19	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
20	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
21	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
22	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
23	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
24	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
25	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
26	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
27	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
28	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
29	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
30	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
31	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
AV	20.0	19.2	18.6	17.9	17.2	16.7	16.2	15.9	16.9	18.6	20.7	23.9	26.8	29.0	31.6	33.4	34.9	35.4	34.9	33.2	30.3	26.4	23.5	21.8	23.0	
SD	1.0	1.0	1.0	1.2	1.3	1.3	1.2	1.1	1.3	1.5	1.5	2.0	2.0	1.6	1.7	1.4	0.9	0.9	1.1	1.4	1.6	1.3	0.9	0.7		
PK	21.0	20.5	20.0	19.7	19.3	18.7	18.0	17.6	18.5	20.5	22.3	25.8	28.7	30.2	33.1	35.0	35.9	36.6	36.1	34.1	31.7	27.8	24.6	22.5		36.6

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TABLE 3-13. Temperature summary for August 1992.



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### 3.2 METEOROLOGICAL CONDITIONS

The winds were predominantly out of the south during the monitoring period. The winds were relatively calm during the monitoring period. The maximum hourly average wind speed was five meters per second. The prevailing wind direction data are summarized for each sampling period in Table 3-2. Table 3-3 is a "key" for interpreting the meteorological data summaries. Tables 3-4 through Table 3-13 are daily summaries of the wind speed, direction, sigma theta and temperature for July 1, 1992 through August 4, 1992.

### 3.3 ACCURACY

Accuracy was determined as the difference between the analyzer response and the reference value obtained during the field audit performed August 1, 1992 by an auditor from AV's quality assurance group. Accuracies were determined from the field audit using the following equation:

$$\text{Accuracy} = \frac{Y - X}{X} \times 100 \quad (3-1)$$

where:

- Y = analyzer value
- X = the true concentration as determined by the audit

The audited flow rates for the 1 liter/min asbestos samplers were consistently 7 to 15 percent higher than the calibrated flow rates, resulting in four of the samplers failing to meet the  $\pm 10$  percent accuracy goal specified in the project QAPP. This difference is most likely due to differences in the calibration curves used for the calibration and audit mass flow meters, resulting in this apparent 10 percent bias. For this report, the lower (calibration) flow rates have been used, since these produce the most conservative (highest) concentrations and are the values determined by the field operator. (Standard operating protocol does not allow the values flowrate values determined by the auditor to be used for any purpose other than assessing accuracy.) (If the flow values determined by the auditor are correct, then the actual asbestos concentrations are 7 to 15 percent lower than those presented in this report. Again, the noted bias is consistent for all samplers, and the ability to make relative comparisons between samplers is not compromised. The audited flow rates for the 16.7 liter/minute mass, arsenic and lead samplers were all within the project's  $\pm 10$  percent accuracy goal.

The audit of the meteorological system found the wind speed sensor to be within the accuracy criteria of 0.25-meter per second. However, the audit found the temperature sensor was reading 1.7°C too high (the accuracy goal was  $\pm 1^\circ\text{C}$ ) and wind direction sensor differed from the auditor's direction check by up to 8° (the accuracy goal for wind direction was 5°). Although these sensors failed to meet the accuracy goals stated in the QAPP, the sensors are of sufficient accuracy for assessing upwind and downwind concentrations for this program.

A complete description of the audit of the meteorological sensors and particulate sampler flow rates is presented in the audit report for this project (AV, 1992b).

### 3.4 PRECISION

Method precision was determined for the mass measurements using the method described in the project QAPP (AV, 1992a) and presented in the EPA PSD guidelines (EPA, 1987a) for collocated particulate samplers. These precision equations and description of the terms are shown below.

The individual precision was calculated for each collocated sample period using the following equation:

$$d_i = \frac{Y - X}{(Y + X)/2} \times 100 \quad (3-2)$$

The average precision was determined using equation 3-3.

$$d_j = \frac{1}{n} \sum d_i \quad (3-3)$$

The standard deviation and upper and lower 95 percent probability limits were determined using equations 3-4 through 3-6.

$$S = [(1/(n-1)) * [(\sum d_i^2) - ((1/n) * (\sum d_i)^2)]]^{0.5} \quad (3-4)$$

$$\text{Upper 95 percent probability precision limit} = d_j + 1.96S \quad (3-5)$$

$$\text{Lower 95 percent probability precision limit} = d_j - 1.96S \quad (3-6)$$

where

- $d_i$  = individual precision check percent difference
- $d_j$  = average precision check percent difference
- Y = primary sample value
- X = collocated sample value

Using the above equations, the following results were found for the particulate data:

Average precision	-9.0%
Standard deviation	3.4%
Upper 95% probability limit	-4.2%
Lower 95% probability limit	-13.7%

The precision results were within the  $\pm 20$  percent specified in the project QAPP.

### 3.5 COMPLETENESS

For the field sampling and laboratory analyses, completeness was calculated as the ratio of acceptable measurements obtained to the total number of planned measurements, excluding downtime due to routine calibrations or audits.

The meteorological data completeness was 100 percent. There was a pump failure on four occasions at site 4 (the collocated sampler), one sample at site 6 was invalidated because the vacuum line between the filter cassette sample pump broke loose and blank samples were collected at both site 4 samplers (the primary sampler and the collocated sampler) during one sampling period due to an operator. No other sampler problems encountered resulted in sample loss. Hence, 92 of the 98 samples were valid, resulting in a data capture of 94 percent, within the 90 percent completeness goal specified in the project QAPP.

## Section 4

### REFERENCES

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- U.S. Environmental Protection Agency (1989): List of Designated Reference and Equivalent Methods. Unnumbered EPA document issue date December 12.