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VELSICOL CHEMICAL CORPORATION 25

AMBIENT AIR MONITORING PROGRAM

1983 Remedial Construction

St. Louis Plant Site

CRA
Consulting Engineers

CONESTOGA-ROVERS & ASSOCIATES LIMITED
651 Colby Drive,
Waterloo, Ontario, Canada N2V 1C2
(519) 884-0510

March 22, 1984

Reference No. 1185
(1218-26)

Mr. R. Johns, Chief
Groundwater Quality Division
Michigan Department of Natural Resources
Steven T. Mason Building
P.O. Box 30028
Lansing, Michigan
48909

Dear Mr. Johns:

Re: Ambient Air Monitoring Program
St. Louis, Michigan

We have enclosed for your information, two copies of the report entitled "Ambient Air Monitoring Program - 1983 Remedial Construction - St. Louis Plant Site".

This report presents operational details and derived data from the ambient air monitoring program implemented at the Velsicol St. Louis, Michigan former plant site during 1983 remedial construction.

Should you require further information, please contact us at your convenience.

Yours very truly,

CONESTOGA-ROVERS & ASSOCIATES LIMITED

Richard G. Shepherd, P. Eng.

RGS:dp

c.c. Mr. K. Banaszek
Mr. T. Shaffer
Mr. F. Rovers
Mr. L. Lipinski

CRA
Consulting Engineers

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651 Colby Drive,
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March 23, 1984

Reference No. 1185
(1218-26)

Mr. R. Johns, Chief,
Groundwater Quality Division
Michigan Department of Natural Resources
Hazardous Waste Division
Steven T. Mason Building
P.O. Box 30028
Lansing, Michigan 48909

Dear Mr. Johns:

Re: Ambient Air Monitoring Program
St. Louis, Michigan

Please find enclosed two (2) sets of three tables, each to be included within the report "Ambient Air Monitoring Program - 1983 Remedial Construction - St. Louis Plant Site".

These tables were mistakenly omitted during the binding of the final copies. Please insert as indicated in the List of Tables.

My apologies for any inconvenience this may have caused.

Yours very truly,

CONESTOGA-ROVERS & ASSOCIATES LIMITED

Catherine A. Cull

CAC/mm
Encl.

c.c. Mr. R. Shepherd
Mr. K. Banaszek
Mr. T. Shaffer
Mr. F. Rovers

TABLE 1

TOTAL SUSPENDED PARTICULATE CONCENTRATIONS EXCEEDING AMBIENT AIR GUIDELINE OF 150 ug/m^3

DATE	MONITORING STATION	TSP CONCENTRATION (ug/m^3)
6-08-83	P2	477
6-26-83	P4	163
7-07-83	P4	176
7-08-83	P3	189
	P5	222
7-11-83	P4	174
	P2	156
7-14-83	P4	168
7-15-83	P4	208
7-27-83	P2	326.0
8-26-83	P4	183.8
8-29-83	P4	219.8

TABLE 2

FUGITIVE EMISSION CONTROLS

MONTH	CALCIUM CHLORIDE UTILIZATION (gallons)	MECHANICAL ROAD SWEEPER UTILIZATION (hours)	NUMBER OF TSP EXCURSIONS
May	5,000	1	0
June	3,000	31.5	2
July	33,000	93.5	8
August	15,000	187	2
September	9,000	167	0
October	2,000	98.5	0
November	2,000	89.5	0

TABLE 3

RADIATION MONITORING

Location	Activity	Initial uR Value	Corrective Action	uR Value Following Corrective Action
Station 14+00 Baseline A 600 feet offset west	Test trenching (surficial)	35	Diverted trench and covered surficial contamination with 2 feet of clay	7
Manhole 12 175 feet south	Installation of internal groundwater collection system (surficial)	100	As above	10
Manhole 6B	Installation of internal groundwater collection system (surficial)	150	As above	0
Manhole 6A	Installation of internal groundwater collection system (surficial)	65	As above	0

VELSICOL CHEMICAL CORPORATION

AMBIENT AIR MONITORING PROGRAM

1983 Remedial Construction

St. Louis Plant Site

March, 1984

Ref. No. 1218 - 26

CONESTOGA-ROVERS & ASSOCIATES LIMITED

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1.0 INTRODUCTION

Under the provisions of the Consent Judgment negotiated between Velsicol Chemical Corporation (Velsicol), the United States Environmental Protection Agency (EPA), the State of Michigan (Michigan) and the United States Department of Justice, Velsicol is required to environmentally secure its former St. Louis, Michigan plant site by November 1984. As stipulated in the Technical Appendix to the Consent Judgment, Velsicol will implement and maintain an ambient air monitoring program during all active remedial construction. This report describes the ambient air monitoring program implemented during the 1983 securement construction and presents monitoring data derived from the monitoring program.

2.0 AMBIENT AIR MONITORING PROGRAM

2.1 SCOPE

The St. Louis plant site ambient air monitoring program was comprised generally of two major activities. The first activity provided an evaluation of the level of airborne suspended particulates migrating from the site on a continuous basis throughout the construction period. The second activity established the concentrations of four specified chemical parameters in the airborne suspended particulates at a predetermined frequency, and at any time total suspended particulates (TSP) exceeded the stipulated ambient air guidelines of 150 micrograms per cubic meter (ug/m^3). The TSP and chemical parameter monitoring programs are described in Sections 3 and 4, respectively.

In addition to determining the concentrations of suspended particulate matter and chemical parameters, on-site monitoring was also provided in the following areas:

1) Monitoring of personnel for respirable particulate matter at specific work locations
2) Organic vapor and combustible gas monitoring

during all construction activity that involved excavation or handling of site soils

3) Radiation monitoring of excavated site soils

Each of the above monitoring programs are described in Section 5.

2.2 PUBLIC PARTICIPATION

Prior to commencing securement construction, each household located within one block of the Plant Site property and any haul route servicing the plant site from the project borrow pit was provided by Velsicol with a letter which described the forthcoming construction and included a hotline telephone number the resident could call in the event that elevated levels of airborne particulate matter, odors, or noise were perceived during construction activities. In addition, the home telephone numbers of the Velsicol, Conestoga-Rovers & Associates Limited (CRA), and contractor's on-site supervisors were provided to the City of St. Louis Fire and Police Departments in the event that odors or airborne particulate matter proved to be a concern during non-working hours.

A copy of the letter provided to each household is contained in Appendix A.

3.0 TOTAL SUSPENDED PARTICULATE MONITORING

3.1 SCOPE

The ambient air monitoring program adhered to the guidelines established in both the Technical Appendix to the Consent Judgment and the Project Construction Specification.

Total suspended particulates were monitored by a network of six air monitoring stations located adjacent to the Plant Site boundary. A meteorological station which monitored wind speed and direction was located atop the project site office near the plant site southerly boundary. Figure 1 illustrates the monitoring and meteorological station locations.

The location of each monitoring station and the meteorological station was field inspected and approved by the MDNR prior to commencement of air monitoring.

Analysis for TSP was conducted by a contract laboratory, Radian Corporation (Radian) of Austin, Texas. The laboratory was responsible for supplying sample filters which had been sequentially

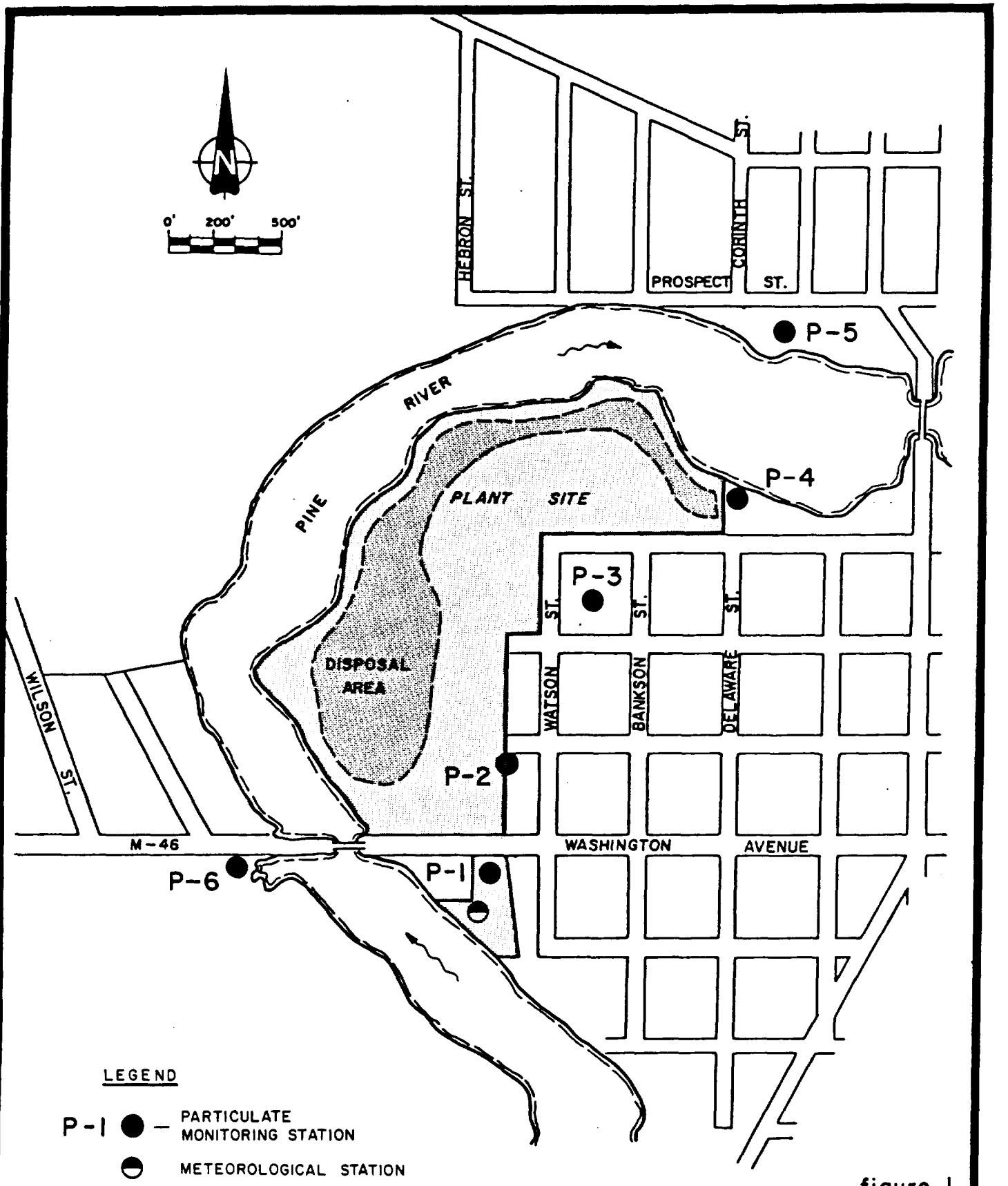

figure 1

METEOROLOGICAL AND PARTICULATE MONITORING STATIONS ST. LOUIS PLANT SITE

Velsicol Chemical Corporation

CRA

1218 - 26 - 14/03/84

numbered, pre-weighed on a constant dry weight basis, and individually packaged in brown manila folders.

3.2 EQUIPMENT

Each monitoring station was equipped with an Accu-Vol, Model GMWS-2310 High-Volume Air Sampler. Air flow through the sampler was maintained by a Kurz Model 310 flow controller. The flow controller incorporated an electronic probe which was located in the orifice between the filter paper and the electric motor. The probe automatically adjusted motor speed to correct for variations in line voltage, temperature, pressure and filter loading.

Air flow through the sampler was monitored by a pressure transducer and flow meter which was connected to a pressure tap at the exhaust end of the motor. The flow meter continuously recorded air flow over the 24-hour sampling period.

An electronically operated minute counter was incorporated into each sampler. This allowed an accurate determination of each sampling period.

Air samplers were housed in anodized aluminum shelters located on wooden platforms at a height of 10 feet to 15 feet above ground level. Each sampler was provided with an electrical service from the City of St. Louis power grid.

Filters measured 8-inches by 10-inches in size and were of spectrograde glass fiber construction. Filters were discarded prior to use if they were torn or ripped.

The meteorological station consisted of an R.M. Young Co. Model 6301 wind vane and Model 6101 3-cup anemometer, and a direct current powered Rustrac twin recording translator.

3.3 OPERATION

All sampling units were calibrated to a flow rate of 45 cubic feet per minute (field) with a water manometer prior to commencing monitoring operations.

Each sampler was manually serviced at an approximate interval of 1440 minutes as determined by the sampler minute counter. For each

daily servicing period, the operator removed the exposed filter and pressure transducer chart, installed a new filter and pressure transducer chart, set the minute counter at zero, noted the time of day, and restarted the sampler. Exposed filters and their respective pressure transducer charts were placed in an individual manila folder for each station. Sampling units were recalibrated whenever the pressure transducer chart indicated a variance in flow rate of $\pm$2 cubic feet per minute (cfm) from the original calibration or immediately following required or routine servicing.

Exposed filters were packaged with that day's sampling data (i.e. time collected, weather conditions and operational comments). The sample date represented a filter which was installed in the morning of that date and underwent a 24-hour sampling period. The sample package was sent via overnight courier (except on weekends) to the laboratory for filter dessication and final weighing.

Electric motor brushes were replaced routinely at approximately monthly intervals. Brush replacement was staggered for all samplers in order that not more than one monitoring station be inactive on any given day. Following each brush

replacement, the sampler underwent a 5-plate calibration test and was recalibrated to 45 cfm (field) with a water manometer.

The meteorological station was calibrated in accordance with the manufacturer's instructions prior to commencing the monitoring program.

3.4 TSP CONCENTRATION CALCULATION

Pre-weighed spectrograde glass fiber filters were provided by the laboratory to the project office in lots of 200 filters. The exposed filters and pressure transducer charts for all working stations were shipped daily to the laboratory via overnight courier except for weekends when the Saturday and Sunday filters and charts were shipped on Monday. Upon receipt by the laboratory, each filter was dessicated for 24 hours and re-weighed. Total suspended particulate concentrations were calculated according to the following formulas:

$$V = FR \times T \times 0.0283$$

$$SP = \frac{W_F - W_i}{V} \times 10^6$$

Where:

V = Air volume sampled (cubic meters)

FR = Flow rate (cubic feet per minute - corrected to standard pressure and temperature)

T = Sampling time (minutes)

Cubic feet air x 0.0283 = cubic meters air

SP = Mass concentration of suspended particulate (ug/m^3)

W_i = Initial weight of filter (g)

W_F = Final weight of filter (g)

10^6 = conversion of (g) to (ug)

Calculated suspended particulate concentrations were reported to CRA field personnel verbally within 48 hours of receipt of the filters by the laboratory. Sampling was conducted continously from May 16 to November 17, 1983. Exceptions are noted in Appendix E and F and discussed further in Section 3.5.

The strip chart from the Rustrac recorder translator was removed weekly and forwarded to the laboratory for data reduction. Integrated hourly averages for meteorological data are contained within Appendix G for the period of May 16, 1983 to November 17, 1983. A lack of data for some days is attributed to the failure of the recorder pen to strike the paper, or the maladjustment of the timing mechanism associated with the movement of the paper.

Prior to the implementation of the air monitoring program, historical data of temperature and atmospheric pressure uncorrected to sea level for the past five years was collected and forwarded to the laboratory. Averages representing the regional atmospheric pressure and temperature were established for 4 sampling periods of three months each. These averages were used in the calculation of the standardized flow rate for each TSP concentration. The formula used to establish the corrected flow is as follows:

$$Q_2 = Q_1 \left(\frac{P_A \; T_s}{P_s \; T_A}\right)$$

Where:

Q_1 = recorded flow rate from transducer chart, ft^3/min

Q_2 = corrected fow rate at sampling conditions, ft^3/min

P_A = regional average atmospheric pressure, mm Hg

T_s = ambient temperature at standard conditions, 298 degrees K

P_s = standard pressure, 760 mm Hg, and

T_A = regional average ambient temperature, degrees K

3.5 Calibration and Maintenance

3.5.1 Calibration

Each high-volume air monitoring unit was calibrated prior to use in the field. Each calibration consisted of an EPA 5-plate, 5 point curve calibration, and an adjustment of the flow controller to 45 cfm (field).

The 5-plate calibration was conducted utilizing a GMW-25 calibration kit and a GMW-35 top loading adapter. The kit consisted of 5 circular metal plates, each containing a different number of holes, and an orifice unit. The latter consisted of a metal cylinder which attached to the top loading adapter. Each plate was individually inserted between the base of the orifice unit and the top of the adapter. After a reading had been obtained for the first plate, it was removed, and the second plate installed. All five plates were sequentially inserted, and data recorded for the observed pressure differential, and actual differential. Field observations and orifice calibration data were integrated to create a 5-point calibration curve. This data was then forwarded to the

analytical laboratory to revise the constants used to calculate daily TSP results.

EPA regulations require that the orifice unit be calibrated on an annual basis in order to validate field calibrations. The project orifice unit was forwarded to the manufacturer for calibration in late May and returned in early June. During this initial time period, a factory orifice unit was used which was provided on loan with its own calibration sheet. Copies of calibration sheets for the project instrument and for the factory supplied unit were forwarded to the project laboratory.

The 5-plate calibration tests were conducted in accordance with EPA regulations. Each monitoring station underwent calibration whenever maintainance was required on the sampler. During these tests, a filter paper was not installed beneath the top loading adapter, and the flow controller was disconnected, so that calibration data would not be affected by an override condition of the flow controller.

The adjustment of the flow controller to 45 cfm was conducted under different conditions. All plates were removed from the orifice unit, a clean filter paper was installed, and the flow controller was reconnected. The flow controller would then be adjusted to the proper flow rate. Pressure transducer volume readings were also recorded, in order to establish a constant record for an individual unit.

Meteorological data for temperature and barometric pressure, uncorrected to sea level, representative of time and date of calibration, were collected and tabulated with the rest of the data to be forwarded to the laboratory. A calibration curve was formulated using the least squares method to establish that each air sampler was operating properly.

After a calibration was completed, the unit was either restarted, providing a time period of less than one hour had elapsed, or shut off until the start of the next 24-hour sampling cycle.

A list of calibration dates for each monitoring station is presented in Appendix E.

3.5.2 Maintenance

Maintenance of the high volume samplers was required primarily due to the failure, or expected failure, of the motor brushes. Brushes required replacement at intervals of approximately 30 days. In order to ensure continuity of sampling, spare motors were purchased, and the entire unit replaced whenever maintenance was undertaken.

The failure of several motors in early July required the purchase and installation of new motors. Periodic factory maintenance of the flow controllers and pressure tranducers was also performed.

3.6 EVALUATION OF TSP DATA

A total of 955 high-volume particulate samples were collected and analyzed over a period of 186 days between May 16 and November 17,

TABLE 1

TOTAL SUSPENDED PARTICULATE CONCENTRATIONS
EXCEEDING AMBIENT AIR GUIDELINE OF 150 ug/m^3

DATE	MONITORING STATION	TSP CONCENTRATION (ug/m^3)
6-08-83	P2	477
6-26-83	P4	163
7-07-83	P4	176
7-08-83	P3	189
	P5	222
7-11-83	P4	174
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7-27-83	P2	326.0
8-26-83	P4	183.8
8-29-83	P4	219.8

1983. TSP concentrations ranged from 6.9 to 477 ug/m^3 during this period. TSP analytical data for all samples are contained in Appendix B.

Of the 955 samples collected, TSP concentrations exceeded the ambient air guideline of 150 ug/m^3 on 12 occasions. Table 1 details the dates, locations and TSP concentration for the 12 excursions. On the basis of the data collected, the St. Louis project was in compliance with TSP allowable limits for 98.7 percent of the samples.

The 12 excursions detailed in Table 1 have been analyzed in detail. Of the 12, eight excursions (66.6%) occurred in July, and two excursions (16.7%) occurred in each of June and August. The large percentage of the total number of excursions that occurred in July is attributable to an extended period of hot dry weather experienced at that time. The problem was compounded by commencement of the clay cap construction during the same period.

Of the twelve excursions, 58.3 percent were reported from monitoring station P4. Station P-4 was located adjacent to the health and hygiene, and laboratory trailers, and was thus subject to exposure from heavy traffic from on-site personnel.

Also, construction of the clay cap, which began on the northeast sector of the plant site during July, had a significant impact on particulate concentrations recorded at the adjacent monitoring station P-4.

Monitoring station P2 recorded the next highest number of excursions, having three of twelve readings exceeding the allowable limit of 150 ug/m^3. Localized activity in the vicinity of P-2 during the oil contamination remedial construction and slurry wall construction resulted in diesel operated equipment working, and dry mixing of bentonite with soil occurring, immediately adjacent to the monitoring station. These activities produced the two highest TSP concentrations of the project.

Only one excursion of the twelve occurred on a non-working day. This was at monitoring station P4 on June 26 with a concentration of 163 ug/m^3. TSP concentrations from the same date were in the range of 89.0 to 110 ug/m^3 for the remaining monitoring stations and meteorological data did not indicate a prevalent wind from one particular direction. This excursion appears to have resulted from general atmospheric conditions at the commencement of a long hot dry period, rather than from specific site conditions.

A TSP concentration of 222 ug/m^3 was observed at monitoring station P5 on July 8, 1983. No ready explanation for this excursion is available. It is noted that grass cutting was conducted in the immediate vicinity of the monitoring station on this date.

3.7 CONTROL OF FUGITIVE EMISSIONS

Primary methods for control of fugitive emissions included the application of calcium chloride to all on-site haul roads, and the use of a mechanical road sweeper to collect particulate matter and minimize dust created by vehicles hauling clay and fill on off-site roadways.

The TSP data was used to determine the degree of fugitive emission controls implemented, with controls applied more intensely from July onward. As illustrated in Table 2, controls were effective during the latter half of the Project in eliminating TSP excursions.

TABLE 2

FUGITIVE EMISSION CONTROLS

MONTH	CALCIUM CHLORIDE UTILIZATION (gallons)	MECHANICAL ROAD SWEEPER UTILIZATION (hours)	NUMBER OF TSP EXCURSIONS
May	5,000	1	0
June	3,000	31.5	2
July	33,000	93.5	8
August	15,000	187	2
September	9,000	167	0
October	2,000	98.5	0
November	2,000	89.5	0

4.0 CHEMICAL ANALYSIS OF TSP SAMPLES

As stipulated in the Consent Judgement, chemical analysis of TSP samples was required during the following remedial activities:

i) Containment wall construction
ii) All on-site grading activities involving contact with native soils
iii) Storm sewer construction
iv) On-site collection system construction

TSP filters were analyzed for four chemical parameters on a routine basis during the period May 16, 1983 to September 29, 1983. The four compounds analyzed were as follows:

i) Hexabromobenzene (HBB)
ii) DDT
iii) Polybrominated biphenyls (PBB)
iv) Tris (2,3-dibromopropyl) Phosphate (Tris)

Analysis for these chemical parameters was performed on filter samples from all monitoring stations once every 15 days. In addition to this regular analytical schedule, chemical analysis was performed on samples that exceeded the TSP limit of 150 ug/m^3.

Filters which were to be analyzed as part of the routine chemical monitoring program were shipped to the laboratory in "pre-cleansed" glass mason jars. The jars were cleansed by rinsing sequentially with acetone, hexane, acetone and distilled water and were then oven dried at 200°C for 20 minutes. After a filter and its respective flow recorder chart were placed in a jar, the jar was covered with aluminum foil and sealed. Filters were shipped by commercial courier under Chain of Custody. Analytical results were verbally reported to Project staff within 60 hours after TSP determination.

The Consent Judgment allowed for either of two methods for chemical analysis: EPA Method 608 (GC) or EPA Method 625 (GC/MS). EPA Method 608 was used exclusively by the project laboratory.

During the time period of May 16th to September 29th, a total of nine biweekly samples from all monitoring stations and 12 individual samples from stations having TSP excursions were analyzed. Additional filters after this period were analyzed at the request of MDNR officials in order to confirm the presence of chemical parameters.

Analytical data for chemical analysis of TSP samples are contained in Appendix C. PBB

and Tris were not detected in any of the 71 samples analyzed. DDT was reported detected in 50 samples at concentrations ranging from 60 to 29,100 ng/filter while HBB was reported detected in 29 samples at concentrations ranging from 380 to 34,100 ng/filter.

On the basis of inconsistencies in the data for both sample and blank analysis, Velsicol has conducted a further analysis of samples using GC/MS techniques. Preliminary results of the analysis indicate that both the DDT and HBB reported concentrations may be significantly overstated due to the erroneous reporting of co-eluting compounds potentially inherent in the Method 608 GC technique. The complete Velsicol reassessment of the TSP chemical analysis program has been provided in the report entitled "Reassessment of Chemical Parameter Monitoring Program for Total Suspended Particulate Samples - St. Louis, Michigan" - Conestoga-Rovers and Associates Limited, March 1984. This report was submitted to Michigan and EPA on March 19, 1984.

5.0 ADDITIONAL MONITORING PROGRAMS

5.1 COMBUSTIBLE GAS MONITORING

During all construction involving excavation, flammability and explosivity were monitored continuously at the work site with a Bendix Combustion Alert Multi-Channel Gas Detection System complete with two remote sensors.

The system was programmed to sound an alarm siren should flammable vapors be present at a concentration above 20% of the lower explosive limit (LEL). The system was equipped with a Fisher Recordall Strip Chart Recorder which provided the operator with a strip chart print-out of LEL percentages for each sensor. The operator also had the capability of interrogating the system at will to provide an LED display of the highest and lowest LEL values since the last interrogation. This operation was performed routinely at least twice in each 24-hour period. A continuous LED display of the current LEL percentage for the highest reading sensor was also provided.

Two remote sensors were employed for the duration of the excavation phase of the

project. These were relocated as required to remain in close proximity to the excavation face. Generally the sensors were located at different elevations near the face in order that heavier and lighter than air vapors would both be monitored.

Initially the sensors were each factory equipped with 250 linear feet of signal cable. The sensor cables were subsequently modified to a total length of 400 linear feet each to enable the operator to locate the sensors more effectively.

Calibration of the system was conducted on a daily basis using a calibration kit supplied by the manufacturer.

The entire system, which included the electronic controller, two sensors, one Fisher recordall recorder, one space heater, and one power alarm, was housed in an enclosed trailer equipped with fluorescent lighting. This enabled the operator to perform routine or emergency service at any time of the day or night.

Throughout the excavation phase of the project, LEL monitoring did not produce detectable readings.

5.2 SPECIFIC COMPOUND MONITORING

Sampling for specific compounds was performed on a periodic basis or at any time odors were noticeable. Compounds sampled for were:

i) Benzene
ii) Carbon Tetrachloride
iii) Phenol
iv) Chloroform
v) 1,2 - Dichloroethane

Sampling occurred at the excavation face and within excavated areas using Draeger tubes. The five monitored compounds were not identified during the sampling program. Sampling dates and results are detailed within Appendix D.

5.3 ORGANIC VAPOR ANALYSIS

An organic vapor analyzer (OVA) Century Model OVA 128 was employed on-site throughout all construction involving the excavation, handling or transport of the site soils. The instrument was maintained, calibrated, and operated by the

contractor's on-site safety officer who made examination of the work site routinely on a daily basis and at any time odors were noticeable.

Maximum allowable organic vapor concentrations for the type of respiratory protection specified for the project were established at 100 ppm for any single reading or 50 ppm for any two successive readings. The vast majority of monitoring indicated organic vapor concentrations as nondetectable or present in the low part per million range. Two elevated transient readings were detected on May 20 and June 2, at concentrations recorded for brief instances at 160 and 100 ppm respectively.

5.4 PERSONNEL DUST MONITORS

Personnel respirable dust monitors were installed by the staff members of the Velsicol Industrial Hygienne Department on pre-selected on-site personnel. These monitors were used to ascertain the levels of on-site total and respirable dust generation to which workers were exposed. Respirable dust was considered to consist of particles <10 microns in diameter, as this fraction constitutes the major hazard to the lungs.

The filters were chemically analyzed to identify the particulate matter. Analysis indicated the presence of bentonite and general dust, but did not detect the four chemical parameters discussed in Section 4.0.

As part of the analysis for respirable dust at St. Louis, the percentage of silica present in bentonite was determined. Calculations for respirable dust were made on the basis of this information.

5.5 RADIATION MONITORING

During the course of construction of the perimeter containment walls and the internal groundwater collection system, the excavation spoils were continually screened for radioactive contamination using a Ludlum Model 19 Micro R Meter. Generally, monitoring indicated radiation levels at or below background levels. Four exceptions, as detailed in Table 3, were encountered. At the conclusion of the

TABLE 3

RADIATION MONITORING

Location	Activity	Initial uR Value	Corrective Action	uR Value Following Corrective Action
Station 14+00 Baseline A 600 feet offset west	Test trenching (surficial)	35	Diverted trench and covered surficial contamination with 2 feet of clay	7
Manhole 12 175 feet south	Installation of internal groundwater collection system (surficial)	100	As above	10
Manhole 6B	Installation of internal groundwater collection system (surficial)	150	As above	0
Manhole 6A	Installation of internal groundwater collection system (surficial)	65	As above	0

corrective action detailed in Table 3, equipment and personnel were screened to ensure that trackage of radioactive contaminated materials did not occur.

6.0 PUBLIC COMPLAINTS

6.1 DUST

During the project, one complaint concerning perceived elevated dust levels was received by the project hot line telephone number. This complaint was received in July during a long, hot, dry spell. Corrective action, including increased street sweeping and calcium chloride application had already been implemented. No further complaints were received.

6.2 NOISE AND SPEEDING

Two direct complaints received on the project hot line telephone, and several complaints lodged with the St. Louis Police Department, alleged excessive speeding by trucks hauling clay from the project borrow pit. CRA requested that the Gratiot County Sheriff's Department monitor the vehicle's speed by radar. Monitoring by the Sheriff's Department indicated that the trucks were in compliance with the local posted speed limits, and no further action was taken.

Several complaints were registered with the St. Louis Police Department with regard to vehicular noise. Following the complaints, truck drivers were instructed to upgrade maintenance on vehicles in the area of exhaust systems, and no further complaints were received.

7.0 MICHIGAN DEPARTMENT OF NATURAL RESOURCES

Several meetings between MDNR officials and project staff were held on-site throughout the project to discuss the air monitoring program. These meetings, and a brief summary of each, are detailed below:

i) June 9, 1983 - L. Lipinski of Groundwater Quality Division and D. Drucker of Air Quality Division visited the site. Discussions centered on a reported elevated DDT concentration in a TSP sample on May 31, 1983, and possible corrective actions. As TSP concentrations had been satisfactory to date, it was agreed to continue with the fugitive emission control program currently in place.

ii) July 15, 1983 - R. Teoh, of Air Quality Division visited the site in order to examine and evaluate the dust control program. Mr. Teoh was particularly concerned with potential dust generation resulting from the mixing of dry bentonite with the containment wall backfill. TSP readings had been fairly high during the current dry, hot spell and Mr. Teoh felt that elimination of the practice of mixing bentonite in the dry would help alleviate dust problems. In addition, Mr. Teoh suggested that the rate of calcium chloride applications be increased.

CRA confirmed these observations and informed the contractor of the need for improved dust control on July 15, 1983.

iii) July 19, 1983 - L. Lipinski visited the site to confirm that the following dust control measures would be initiated.

a) If dry bentonite is mixed with containment wall backfill, water shall be added in order to reduce dust generation.

b) Calcium chloride will be spread over the entire plant site.

c) Regular watering of North Street will be continued.

CRA ensured implementation of the measures.

4) July 21, 1983 - D. Drucker and T. Monosmith, of Air Quality, conducted an audit on two of the ambient air monitors. The monitors audited were stations P-2 and P-4.

5) August 9, 1983 - D. Drucker inspected the site for general observations. She noted that dust control methods had been improved.

6) August 25, 1983 - D. Drucker and R. Teoh met with CRA personnel to discuss the July, 1983 air monitoring results. Observing that 8 of the 12 excursions to date had occurred in July, they were concerned as to whether the revised dust control methods had succeeded in reducing TSP concentrations. As there had been no excursions to date during August, it was agreed that the contractors dust control program would remain unchanged.

8.0 CONCLUSIONS

a) The ambient air monitoring program, specified in the Consent Judgment signed by Velsicol, Michigan, EPA and the United States Department of Justice, was implemented during all remedial construction occurring on the Velsicol, St. Louis plant site in 1983.

b) Boundary monitoring for total suspended particulate (TSP) indicated that control measures for fugitive emissions implemented by Velsicol resulted in a compliance rate of approximately 99 percent through the duration of 1983 construction.

c) Data derived during the ambient air monitoring program from chemical analysis of TSP samples are inconsistent and inconclusive. Velsicol has completed and submitted a detailed reassessment study of the data to EPA and Michigan.

d) Complaints received from the general public and the St. Louis Police Department were few in number, and when received, were expeditiously resolved by project staff.

e) Dialogue on a continuous basis was established between Michigan and Velsicol project staff. Suggestions

received from Michigan staff were in all cases thoroughly evaluated and subsequently implemented by Velsicol.

APPENDIX A

LETTER TO ST. LOUIS RESIDENTS

VELSICOL CHEMICAL CORPORATION

500 BANKSON STREET • ST. LOUIS, MICHIGAN 48880 • 517-681-2141

May 10, 1983

Dear Resident:

As you are probably aware, a contract to secure environmentally the old plant site will commence in the near future. During the period of construction activity, every effort will be taken to limit to a minimum disturbance of persons residing in areas adjacent to the construction site and haul roads.

A comprehensive dust and odor control program has now been implemented. In the unlikely event you are inconvenienced by dust or odor arising from construction activities, you are to inform the Dust Control Center (517-681-5726) or (517-681-2141) of your problem. Upon receipt of a complaint, Velsicol will investigate the source of the problem and immediately institute appropriate remedial measures.

Should you require further information at any time, please contact Mr. Ed Smith or Mr. Don Robinson at the above noted numbers.

APPENDIX B

TOTAL SUSPENDED PARTICULATE DATA

APPENDIX B

TOTAL SUSPENDED PARTICULATE CONCENTRATIONS

SAMPLING STATION

SAMPLING DATE	P1		P2		P3		P4		P5		P6	
	AFR	TSP	AFR	TSP	AFR	TSP	AFR	TSP	AFR	TSP	AFR	TSP
05/16/83	44.16	44.1	46.60	27.5	46.23	35.5	42.18	20.4	--	--	44.96	36.7
05/17/83	45.37	52.5	47.15	52.6	48.05	51.0	--	--	43.29	54.3	45.50	44.6
05/18/83	44.70	73.3	47.15	72.5	46.20	73.1	--	--	43.30	73.8	45.50	67.9
05/19/83	44.70	30.8*	47.15	27.6	48.05	29.6	42.18	51.2*	43.30	33.5*	45.50	62.1
05/20/83	44.80	41.2	47.15	38.3	49.87	39.0	44.71	52.3	43.28	45.3	45.49	43.8
05/21/83	--	--	--	--	45.33	52.5	44.71	54.1	43.29	55.9	45.49	52.6
	MONITORS SHUT DOWN UNTIL ON-SITE ACTIVITY WAS BEGUN											
05/24/83	44.76	55.6	45.65	47.7	40.20	59.3	40.90	98.0	40.24	69.8	40.31	56.4
05/25/83	44.76	17.4*	45.65	7.7*	40.20	11.8	43.98	14.0	40.24	16.0*	40.31	19.1*
05/26/83	44.76	27.1	47.10	17.2	40.20	19.7	42.96	24.3	39.21	27.1	40.31	26.1
05/27/83	44.76	59.7	48.06	80.7	40.20	70.6	43.98	86.8	40.24	73.7	40.31	70.9
05/28/83	44.76	64.2	48.10	63.2	40.20	75.3	43.98	75.4	40.25	75.2	40.31	71.2
05/29/83	44.76	24.6	47.10	22.0	33.91	30.4	43.98	25.8*	38.17	27.4	40.31	28.5
05/30/83	44.76	17.4	47.10	16.5	40.20	18.2	42.96	19.0	39.21	18.7	40.31	20.2
05/31/83	44.76	21.2	47.10	14.8	36.01	15.3	42.96	17.0	39.21	16.5	40.31	24.5
06/01/83	43.76	23.5	46.08	22.7	39.35	24.9	42.06	34.5	39.36	26.8	39.44	27.2
06/02/83	43.76	51.4	47.96	55.7	39.35	55.5	43.06	78.6	39.36	58.7	39.44	59.0
06/03/83	43.76	50.1	46.08	46.7	39.35	54.5	42.06	58.1	40.83	56.8	39.44	56.3
06/04/83	43.76	37.0	46.08	31.4	38.32	37.2	42.06	36.9	40.83	36.5	39.44	42.3
06/05/83	43.76	20.0	--	--	39.35	15.8	42.06	17.1	37.33	20.4	39.44	24.4
06/06/83	43.76	35.1	--	--	39.35	39.4	42.06	37.1	40.83	30.6	39.44	42.1
06/07/83	--	--	49.70	43.0	39.35	48.5	42.06	68.6	38.35	41.4	39.44	40.6
06/08/83	48.76	39.7	50.81	477	--	--	42.06	51.5	37.33	51.2	39.44	42.7
06/09/83	48.76	54.6	54.14	60.9	45.04	93.3	42.06	91.2	39.36	76.6	39.44	69.8
06/10/83	44.23	71.4	53.03	72.9	45.04	61.5	42.06	71.9	38.35	75.7	39.44	73.6
06/11/83	44.23	109	54.14	95.4	45.04	111	42.06	134	38.35	134	39.44	123
06/12/83	44.23	97.2	54.14	84.7	45.04	99.5	42.06	120	39.36	124	--	--

APPENDIX B

TOTAL SUSPENDED PARTICULATE CONCENTRATIONS

SAMPLING STATION

SAMPLING DATE	P1		P2		P3		P4		P5		P6	
	AFR	TSP	AFR	TSP	AFR	TSP	AFR	TSP	AFR	TSP	AFR	TSP
06/13/83	44.23	107	54.14	130	45.05	113	42.06	140	--	--	45.72	103
06/14/83	44.23	106	54.14	104	45.04	108	42.06	138	48.50	105	45.72	112
06/15/83	44.23	42.3	53.03	93.8	45.04	61.2	--	--	48.50	51.7	--	--
06/16/83	44.23	66.5	53.03	120	45.04	77.6	42.06	112	48.50	50.8	--	--
06/17/83	44.23	89.6	53.03	71.5	45.04	56.7	42.06	72.1	48.50	50.0	45.72	56.0
06/18/83	44.23	44.8	53.03	35.3	45.04	42.5	42.06	42.3	48.50	43.5	45.72	41.8
06/19/83	44.23	49.7	53.03	36.4	45.04	42.9	42.06	43.0	48.50	42.3	43.75	48.3
06/20/83	44.23	91.3	53.03	62.2	45.04	80.4	42.06	75.2	48.50	68.5	43.75	86.9
06/21/83	44.23	105	53.03	114	45.04	62.9	42.06	105	49.58	119	43.75	100
06/22/83	44.23	101	53.03	141	45.04	111	46.14	121	49.58	98.0	43.75	103
06/23/83	44.23	111	53.03	114	45.04	114	46.14	126	48.50	84.6	43.75	87.2
06/24/83	45.45	111	55.24	55.3	45.04	78.0	42.01	48.5	48.50	51.6	43.75	50.4
06/25/83	45.45	57.9	53.03	49.4	45.04	56.4	41.05	60.5	49.58	51.8	--	--
06/26/83	45.45	97.8	54.14	89.0	45.04	110	41.05	163	49.58	90.0	--	--
06/27/83	44.23	49.7	51.92	31.0	45.00	34.0	41.05	33.6	48.50	27.7	--	--
06/28/83	44.23	51.9	50.81	17.9	43.88	20.8	41.05	20.4	48.50	20.0	--	--
06/29/83	44.23	41.6	53.03	33.2	45.00	40.7	41.05	44.4	48.50	35.0	--	--
06/30/83	44.23	56.3	53.03	68.3	45.00	59.7	41.05	68.5	48.50	56.7	--	--
07/01/83	44.23	38.6	53.03	69.5	45.00	43.7	41.05	61.8	49.58	36.2	45.99	36.4
07/02/83	44.23	45.2	--	--	45.00	45.5	42.06	49.9	48.50	43.6	45.99	43.7
07/03/83	46.66	51.7	--	--	46.20	55.0	42.06	62.6	49.58	51.5	45.99	46.3
07/04/83	45.45	31.5	57.46	24.5	45.04	32.8	41.05	37.5(a)	48.50	29.2	45.99	31.2
07/05/83	44.23	37.2	--	--	45.00	46.9	41.05	29.7(b)	48.50	33.9	45.99	22.5
07/06/83	43.76	36.4	--	--	39.35	56.4	34.02	31.9	48.50	37.4	45.99	34.7
07/07/83	43.76	47.5	55.24	49.2	39.35	73.0	42.06	176	48.50	65.3	45.99	44.4

APPENDIX B

TOTAL SUSPENDED PARTICULATE CONCENTRATIONS

SAMPLING STATION

SAMPLING DATE	P1		P2		P3		P4		P5		P6	
	AFR	TSP	AFR	TSP	AFR	TSP	AFR	TSP	AFR	TSP	AFR	TSP
07/08/83	43.76	94.3	--	--	45.00	189	41.05	143	48.50	222	45.99	90.5
07/09/83	43.76	45.2	--	--	45.00	44.0	41.05	44.0	48.50	44.4	45.99	43.2
07/10/83	--	--	--	--	45.00	36.7	41.05	45.1	48.50	38.7	45.99	35.8
07/11/83	--	--	49.21	103	--	--	41.05	174	49.56	124	--	--
07/12/83	47.25	70.3	49.21	45.0	--	--	--	--	48.50	48.6	--	--
07/13/83	--	--	49.21	116	46.30	65.6	--	--	49.58	68.0	46.21	62.5
07/14/83	--	--	49.21	156	46.35	114	47.61	168	48.50	107	46.21	104
07/15/83	50.06	138	49.21	136	46.30	134	48.72	208	49.56	111	46.21	127
07/16/83	51.21	95.5	49.21	94.0	47.71	94.4	48.72	94.1	--	--	47.38	101
07/17/83	52.36	40.3	49.21	34.2	46.34	37.4	47.61	40.4	47.44	39.5	47.38	43.9
07/18/83	--	--	49.21	37.7	36.34	50.6	47.61	46.8	46.38	33.3	47.38	41.3
07/19/83	--	--	49.21	71.2	36.34	71.9	47.61	121.0	46.38	39.3	--	--
07/20/83	44.29	46.4	49.21	34.4	36.34	46.0	47.61	71.8	46.38	32.9	45.33	40.0
07/21/83	44.29	53.1	49.21	46.8	36.34	63.4	--	--	46.38	37.7	45.33	40.9
07/22/83	45.47	36.1	49.21	34.8	36.34	56.5	47.61	45.5	46.38	37.2	45.33	34.2
07/23/83	44.29	48.1	49.21	43.7	36.24	54.7	47.61	48.4	47.44	40.4	45.35	48.0
07/24/83	44.29	35.0	49.21	27.2	36.24	41.3	47.21	27.8	46.38	30.6	47.38	28.8
07/25/83	44.29	79.2	49.21	41.3	36.34	89.5	47.61	34.2	47.44	39.4	46.35	45.2
07/26/83	44.29	71.8	49.21	58.6	36.34	70.4	47.61	51.5	46.38	45.2	45.33	49.3
07/27/83	44.29	69.5	49.21	326.0	36.34	125	47.61	130	46.38	80.4	40.33	69.9
07/28/83	44.29	55.3	47.01	85.3	43.62	92.3	49.83	81.7	45.33	83.4	43.23	86.2
07/29/83	44.29	49.6	49.21	46.4	36.34	57.7	47.61	45.6	46.38	46.5	41.21	54.7
07/30/83	44.29	38.8	49.21	34.7	36.34	48.0	47.61	37.8	46.38	34.1	44.30	38.7
07/31/83	44.29	39.9	49.21	38.7	36.34	50.4	47.61	42.5	46.38	40.6	43.23	42.4
08/01/83	44.29	22.8	49.21	14.9	--	--	47.61	24.7	46.38	14.9	43.23	26.2

APPENDIX B

TOTAL SUSPENDED PARTICULATE CONCENTRATIONS

SAMPLING STATION

SAMPLING DATE	P1 AFR	P1 TSP	P2 AFR	P2 TSP	P3 AFR	P3 TSP	P4 AFR	P4 TSP	P5 AFR	P5 TSP	P6 AFR	P6 TSP
08/02/83	44.29	41.1	49.21	36.8	--	--	47.61	43.8	46.38	34.4	43.23	39.1
08/03/83	44.29	60.0	49.21	59.0	49.20	58.1	47.61	101.4	46.38	73.0	43.23	62.1
08/04/83	44.29	56.9	49.21	43.2	49.20	56.4	47.61	32.9	46.38	36.7	43.23	60.1
08/05/83	43.11	79.5	49.21	45.5	49.20	66.3	47.61	41.7	46.38	41.3	43.23	77.4
08/06/83	43.11	45.6	49.21	35.4	49.20	45.6	47.61	81.1	46.38	38.8	43.23	53.7
08/07/83	44.29	41.4	49.21	32.3	49.20	33.8	47.61	40.3	46.30	35.7	43.23	40.3
08/08/83	44.29	73.9	49.21	71.7	49.20	93.8	47.61	131.7	46.38	59.5	45.33	61.9
08/09/83	--	--	49.21	65.1	47.98	80.7	47.61	37.8	46.38	40.8	43.23	49.4
08/10/83	41.93	40.3	48.11	31.0	47.98	35.9	47.61	43.9	--	--	43.23	31.2
08/11/83	45.10	26.0	DOWN WITH CONSENT OF MICHIGAN DEPARTMENT OF NATURAL RESOURCES									
08/12/83	46.17	34.6	50.30	27.5	46.96	30.5	46.13	30.5	48.76	24.5	51.37	29.1
08/13/83	46.17	36.8	50.30	40.2	46.96	40.6	43.97	33.7	50.92	41.2	52.53	32.3
08/14/83	46.17	54.2	50.30	53.1	46.96	52.2	46.13	61.0	50.92	53.3	52.53	49.9
08/15/83	46.17	78.6	50.30	79.5	46.96	93.4	46.13	129.8	50.92	84.8	52.53	77.6
08/16/83	46.17	86.9	51.43	88.2	46.96	97.5	46.13	137.3	50.92	104.8	52.53	84.5
08/17/83	45.10	64.0	50.30	72.3	46.96	77.1	45.05	77.6	49.84	61.1	52.53	60.5
08/18/83	44.04	62.0	50.30	56.4	46.96	64.2	39.66	50.2	50.92	51.5	52.53	54.8
08/19/83	45.10	80.1	51.43	85.7	46.96	110.3	46.13	137.5	50.92	98.4	53.69	75.1
08/20/83	45.10	69.8	50.30	88.9	46.96	56.0	46.13	42.4	48.76	53.7	54.84	43.1
08/21/83	44.04	45.4	50.30	45.5	46.96	47.3	45.05	55.1	50.92	43.2	54.84	39.6
08/22/83	44.04	34.6	49.17	60.1	45.83	30.0	43.97	20.5	49.84	23.8	54.84	29.7
08/23/83	44.04	47.6	50.30	43.7	45.83	46.1	45.05	35.0	48.76	32.7	54.84	40.3
08/24/83	44.04	68.5	50.30	71.7	49.96	76.3	45.05	78.9	49.84	62.0	54.84	62.6
08/25/83	44.04	67.0	50.30	98.1	46.96	73.8	45.05	109.7	48.76	79.1	53.69	62.1
08/26/83	44.04	71.2	49.17	110.9	46.96	108.7	45.05	183.8	49.84	72.9	54.84	70.5

APPENDIX B

TOTAL SUSPENDED PARTICULATE CONCENTRATIONS

SAMPLING STATION

SAMPLING DATE	P1 AFR	P1 TSP	P2 AFR	P2 TSP	P3 AFR	P3 TSP	P4 AFR	P4 TSP	P5 AFR	P5 TSP	P6 AFR	P6 TSP
08/27/83	44.04	40.6	50.30	36.3	46.96	38.4	43.97	40.7	49.84	40.0	54.84	40.1
08/28/83	45.10	36.5	50.30	38.1	46.96	34.6	45.05	39.4	49.84	38.6	54.84	34.2
08/29/83	44.04	52.9	50.30	113.5	46.96	69.0	45.05	219.8	50.92	49.3	54.84	45.3
08/30/83	44.04	29.8	49.17	29.0	46.96	26.3	43.97	32.2	48.76	23.7	54.84	27.7
08/31/83	44.04	42.3	50.30	36.4	46.96	62.4	43.97	31.7	49.84	32.0	52.53	40.0
09/01/83	44.04	46.6	49.17	47.7	46.96	49.6	45.05	65.5	48.76	46.9	54.84	36.2
09/02/83	44.04	61.2	49.17	67.7	46.96	71.2	45.05	114	48.76	86.8	52.53	60.4
09/03/83	44.04	74.3	46.91	118	46.96	99.4	46.13	118	48.76	87.1	54.84	66.1
--------		MONITORS SHUT DOWN DURING LABOR DAY WEEKEND										
09/06/83	44.04	21.9	50.30	21.1	46.96	20.8	43.97	24.5	46.59	11.5	52.53	21.3
09/07/83	44.04	31.9	49.17	137	46.96	37.2	43.97	62.5	48.76	28.6	52.53	39.4
09/08/83	44.04	48.8	49.17	65.4	46.96	68.1	43.97	119	48.76	59.9	52.53	44.8
09/09/83	44.04	69.7	51.43	122	46.96	100	43.97	130	50.92	104	--	--
09/10/83	44.04	49.7	49.17	60.2	46.96	71.6	43.97	136	49.84	79.1	--	--
09/11/83	44.04	24.1	49.17	23.0	46.96	22.5	43.97	27.3	48.76	23.9	48.05	23.6
09/12/83	44.04	30.6	--	--	46.96	46.6	43.97	13.1	48.76	15.3	48.05	21.0
09/13/83	44.04	50.3	45.69	37.3	--	--	43.97	45.0	46.59	30.5	48.05	29.7
09/14/83	44.04	46.9	45.69	36.1	47.32	38.8	45.05	38.2	--	--	48.05	22.6
09/15/83	44.04	38.0	45.69	41.5	47.32	44.9	--	--	48.92	38.2	48.05	32.4
09/16/83	--	--	45.69	23.3	47.32	22.7	--	--	54.71	22.4	45.63	25.1
09/17/83	38.96	27.1	45.69	19.9	47.32	19.9*	41.01	24.9	54.71	21.4	64.96	16.4
09/18/83	47.31	44.9	53.86	37.3	48.40	42.5	44.42	49.8	54.71	43.3	--	--
09/19/83	53.27	48.4	--	--	47.32	45.4	45.56	46.5	54.71	41.6	46.84	40.8
09/20/83	56.85	16.6	42.62	18.2	47.32	16.5	44.42	24.7	54.71	16.5	46.84	15.8
09/21/83	56.85	10.1	41.60	9.0	47.32	7.1	44.42	11.9	53.55	7.0	46.84	11.4

APPENDIX B

TOTAL SUSPENDED PARTICULATE CONCENTRATIONS

SAMPLING STATION

SAMPLING DATE	P1 AFR	P1 TSP	P2 AFR	P2 TSP	P3 AFR	P3 TSP	P4 AFR	P4 TSP	P5 AFR	P5 TSP	P6 AFR	P6 TSP
09/22/83	56.85	9.1	41.60	20.5	47.32	8.9	44.42	10.8	52.40	6.2	45.63	11.0
09/23/83	56.85	18.7	41.60	19.4	47.32	18.3	44.42	35.5	53.55	15.0	45.63	19.6
09/24/83	56.85	34.0	42.62	38.8	47.32	37.0	44.42	76.4	53.55	44.1	48.05	33.0
09/25/83	56.85	35.5	41.60	40.8	46.84	35.9	45.56	38.3	53.55	35.9	46.84	35.1
09/26/83	43.73	60.8	42.62	52.1	--	--	--	--	53.55	48.7	45.63	51.5
09/27/83	54.46	76.6	41.60	78.6	47.32	77.8	43.28	113	54.71	81.5	45.63	74.7
09/28/83	--	--	42.62	82.2	47.32	83.0	43.28	95.5	51.24	94.7	45.63	78.5
09/29/83	49.69	92.1	42.62	101	47.32	100	44.42	113	53.55	107	--	--
09/30/83	46.12	94.6	43.64	92.3	47.32	97.4	43.28	92.2	47.76	87.9	--	--
10/01/83	46.12	58.6	44.66	66.1	47.32	70.0	--	--	47.76	64.1	44.36	60.9
10/02/83	47.31	84.9	45.83	89.0	47.32	88.2	--	--	48.92	85.8	45.61	82.1
10/03/83	47.31	92.0	45.83	108.0	47.32	116.0	--	--	47.76	101.0	45.61	93.6
10/04/83	46.12	21.5	43.64	15.8	47.32	13.1	47.83	12.3	47.76	16.0	45.61	14.9
10/05/83	46.12	21.6	44.66	18.3	47.32	17.1	54.65	11.1	--	--	45.61	23.1
		MONITORS	SHUT	DOWN DUE TO LACK OF ACTIVITY ON-SITE								
10/10/83	44.92	46.9	43.64	54.5	47.32	52.1*	43.28	70.2	48.92	54.1	45.61	48.4
10/11/83	47.31	51.9	44.66	59.4	47.32	56.7	43.28	82.9	50.08	58.6	45.61	52.1
10/12/83	47.31	15.0	--	--	47.32	16.4	43.28	26.4	45.45	19.3	45.61	16.9
		MONITORS	SHUT	DOWN DUE TO LACK OF ACTIVITY ON-SITE								
10/17/83	44.92	29.7	--	--	47.32	23.6	--	--	41.97	29.6	45.61	32.3
10/18/83	44.92	44.2	43.64	43.5	47.32	14.6	43.28	61.9	45.45	50.2	45.61	39.7
10/19/83	--	--	42.62	30.0	--	--	43.28	26.9	45.45	28.3	44.36	29.0
10/20/83	--	--	43.64	37.8	47.32	45.2	43.28	31.2	45.45	35.0	44.36	39.7
10/21/83	42.54	71.7	43.64	60.8	47.32	69.0	43.28	59.4	45.45	61.3	45.61	56.0
10/22/83	42.54	20.0	43.64	18.4	47.32	18.0	43.28	19.2*	45.45	18.4	45.61	18.6
10/23/83	42.54	19.2	43.64	17.5	47.32	18.1	43.28	17.3	46.61	17.4	45.61	17.7
10/24/83	42.54	29.5	43.64	23.2	47.32	32.1	43.28	21.9	45.45	25.5	45.61	29.3
10/25/83	42.54	21.0	43.64	17.5	47.32	15.0	43.28	18.2	41.97	15.1	45.61	20.9

APPENDIX B

TOTAL SUSPENDED PARTICULATE CONCENTRATIONS

SAMPLING STATION

SAMPLING DATE	P1		P2		P3		P4		P5		P6	
	AFR	TSP	AFR	TSP	AFR	TSP	AFR	TSP	AFR	TSP	AFR	TSP
10/26/83	47.53	19.6	48.65	16.5	48.66	15.8	49.25	21.6	45.45	24.3	43.11	24.9
10/27/83	50.37	32.1	48.65	32.8	51.20	32.6	--	--	46.61	41.5	45.61	32.0
10/28/83	47.53	43.4	48.65	42.1	51.20	81.5	--	--	45.45	33.1	45.61	33.9
10/29/83	47.53	52.2	48.65	67.6	48.66	60.3	56.39	34.3	45.45	23.4	44.36	41.5
10/30/83	47.53	58.6	47.56	66.0	48.66	58.1	56.39	55.4	43.13	61.0	44.36	57.0
10/31/83	48.95	75.0	48.65	86.7	48.66	95.9	47.40	87.7	45.45	82.9	44.36	83.9
11/01/83	47.53	90.1	--	--	51.20	85.2	47.40	94.1	46.61	94.3	44.36	89.5
11/02/83	47.53	36.3*	--	--	49.93	33.3	47.40	31.8*	45.45	32.2	--	--
11/03/83	48.95	13.6	51.40	6.9	48.66	8.7	47.40	8.0	45.45	15.3	44.36	14.4
11/04/83	47.53	24.7	51.40	14.8	51.20	16.8	45.03	15.8	45.45	23.8	45.61	23.0
11/05/83	47.53	31.8	51.40	33.1	51.20	36.7	47.40	47.9	47.76	45.8	45.61	41.4
11/06/83	47.53	40.2	51.40	34.9	48.66	35.1	47.40	38.1	--	--	45.61	41.1
11/07/83	MONITORS DOWN DUE TO LACK OF BLANK FILTERS											
11/08/83	39.57	64.4	51.40	52.0	51.20	83.3	52.09	83.9	--	--	56.70	54.7
11/09/83	39.57	97.4	51.40	81.2	51.20	85.8	52.09	80.3	55.96	82.4	60.06	77.5
11/10/83	37.27	47.3	51.40	38.8	49.93	51.0	52.09	28.5	53.73	32.7	59.06	52.5
11/11/83	37.27	13.5	32.92	3.5	49.93	9.3*	50.96	9.0	52.62	13.4	--	--
11/12/83	37.27	28.7	51.40	17.8	48.66	20.2	50.96	24.0	53.73	29.1	55.03	28.1
11/13/83	37.27	38.7	51.40	30.6	48.66	32.5	52.09	42.5	49.28	30.0	55.03	28.8
11/14/83	39.57	50.8	51.40	41.6	49.93	48.2	52.09	59.1	52.62	46.4	56.03	39.0
11/15/83	37.27	36.8	51.40	26.0	49.93	26.7	52.09	26.0	49.28	27.2	56.03	30.0
11/16/83	37.27	19.1	51.40	10.3	49.93	12.3	52.09	12.5	53.73	15.8	55.03	15.8
11/17/83	37.27	31.1	51.40	19.8	48.66	20.7	52.09	22.0	53.73	20.9	55.03	20.4

APPENDIX B

TOTAL SUSPENDED PARTICULATE CONCENTRATIONS

SAMPLING STATIONS

NOTES: 1) * - Transducer volume reading not available, used previous day's reading to calculate TSP.

2) (a) - Filter edges frayed

3) (b) - Filter torn

4) TSP - Total suspended particulates, ug/m^3

5) AFR - Average flow rate, cfm

APPENDIX C

CHEMICAL ANALYSIS OF TSP SAMPLES

APPENDIX C

CHEMICAL ANALYSIS OF TSP SAMPLES

STATION #	DATE	Chemical Concentration (ng/filter) HBB	DDT	PBB	TRIS	REMARKS
P1	5/16/83	ND	ND	ND	ND	Routine Bi-weekly
P2		ND	ND	ND	ND	Analysis
P3		ND	ND	ND	ND	
P4		ND	ND	ND	ND	
P5		ND	ND	ND	ND	
P6		ND	ND	ND	ND	
P1	5/31/83	ND	ND	ND	ND	Routine Bi-weekly
P2		ND	ND	ND	ND	Analysis
P3		ND	ND	ND	ND	
P4		ND	860	ND	ND	
P5		ND	ND	ND	ND	
P6		ND	ND	ND	ND	
P2	6/8/83	ND	ND	ND	ND	TSP Excursion P2 = 477 ug/m^3
P1	6/15/83	ND	410	ND	ND	Routine Bi-Weekly
P2		ND	980	ND	ND	Analysis
P3		2280	930	ND	ND	
P4		--	--	--	--	P4-Motor Down for Maintenance
P5		1190	1300	ND	ND	
P6		--	--	--	--	P6-Motor Down for Maintenance
P4	6/26/83	2880	1580	ND	ND	TSP Excursion P4 = 162.9 ug/m^3

APPENDIX C

CHEMICAL ANALYSIS OF TSP SAMPLES

STATION #	DATE	Chemical Concentration (ng/filter) HBB	DDT	PBB	TRIS	REMARKS
P1	6/30/83	ND	220	ND	ND	Routine Bi-weekly
P2		ND	350	ND	ND	Analysis
P3		ND	410	ND	ND	
P4		660	580	ND	ND	
P5		ND	660	ND	ND	
P6		--		--	--	P5-Motor Down for Maintenance
BLANK		ND	100	ND	ND	
P4	7/7/83	3600	4300	ND	ND	TSP Excursion P4 = 176.0 ug/m^3
P3	7/8/83	6300	8800	ND	ND	TSP Excursion P3 = 189.0 ug/m^3
P5		6900	4900	ND	ND	P5 = 222.0 ug/m^3
P4	7/11/83	200	130	ND	ND	TSP Excursion P4 = 174 ug/m^3
P2	7/14/83	1690	870	ND	ND	TSP Excursion P2 = 156 ug/m^3
P4		2160	1690	ND	ND	P4 = 168 ug/m^3
P1	7/15/83	380	370	ND	ND	Routine Bi-Weekly
P2		4620	1090	ND	ND	Analysis
P3		3730	2000	ND	ND	
P4		2200	2040	ND	ND	TSP Excursion P4 = 208 ug/m^3
P5		ND	170	ND	ND	
P6		ND	120	ND	ND	

APPENDIX C

CHEMICAL ANALYSIS OF TSP SAMPLES

STATION #	DATE	Chemical Concentration (ng/filter) HBB	DDT	PBB	TRIS	REMARKS
P2	7/27/83	4050	1550	ND	ND	TSP Excursion P2 = 326.0 ug/m^3
P1	7/30/83	ND	120	ND	ND	Routine Bi-Weekly
P2		ND	230	ND	ND	Analysis
P3		ND	190	ND	ND	
P4		ND	880	ND	ND	
P5		ND	60	ND	ND	
P6		ND	120	ND	ND	
P1	8/15/83	ND	ND	ND	ND	Routine Bi-Weekly
P2		ND	160	ND	ND	Analysis
P3		ND	640	ND	ND	
P4		ND	ND	ND	ND	
P5		ND	460	ND	ND	
P6		ND	150	ND	ND	
P4	8/26/83	1220	1230	ND	ND	TSP Excursion P4 = 183.8 ug/m^3
P1	8/29/83	3000	260	ND	ND	Routine Bi-Weekly
P2		34100	1360	ND	ND	Analysis
P3		10800	2420	ND	ND	
P4		450	140	ND	ND	TSP Excursion P4 = 219.8 ug/m^3
P5		1350	1120	ND	ND	
P6		ND	1370	ND	ND	
BLANK		ND	790	ND	1030 (3)	

APPENDIX C

CHEMICAL ANALYSIS OF TSP SAMPLES

STATION #	DATE	Chemical Concentration (ng/filter) HBB	DDT	PBB	TRIS	REMARKS
P2	9/7/83	980	888	ND	ND	Additional analysis as
P4		920	1790	ND	ND	agreed to with MDNR
P5		ND	386	ND	ND	
BLANK		ND	243	ND	ND	
P3	9/8/83	ND	1570	ND	ND	Additional analysis as
P4		1090	29100	ND	ND	agreed to with MDNR
P5		ND	1320	ND	ND	
BLANK		ND	77	ND	ND	
P1	9/13/83	2200	ND	ND	ND	Routine Bi-Weekly
P2		6690	ND	ND	ND	Analysis
P3		--	--	--	--	P3-Motor Down for Maintenance
P4		ND	ND	ND	ND	
P5		ND	ND	ND	ND	
P6		4160	ND	ND	ND	
BLANK		ND	710	ND	ND	
P3	9/27/83	1200	1210	ND	ND	Analyses run on
P4		1090	1170	ND	ND	additional filters as
P5		ND	ND	ND	ND	part of confirmation investigation regarding
P6	9/28/83	ND	1260	ND	ND	presence of HBB and DDT
BLANK		ND	100	ND	ND	

Notes:
1) ND - Not Detected
2) TSP - Total Suspended Particulates
3) TRIS was incorrectly identified in the initial analysis. A phone conversation with Ron Smith of Radian on September 8, 1983 clarified that this result was a false positive
4) Blanks, where not reported, are ND for all four compounds

APPENDIX D

DRAEGER TUBE SAMPLING RESULTS

APPENDIX D

DRAEGER TUBE SAMPLING RESULTS

Gases and Vapours to be measured	Draeger Tube Used	Range of Sensitivity	SAMPLING DATES AUGUST 4	AUGUST 8	AUGUST 16	AUGUST 24	AUGUST 29
1) Benzene	Benzene 5/6	5-50 ppm	ND	ND	ND	ND	ND
2) Carbon Tetrachloride	Carbon Tetrachloride	5-50 ppm	ND	ND	ND	ND	ND
3) Phenol	Phenol 5/a	5 ppm	ND	ND	ND	ND	ND
4) Chloroform	Methyl bromide 5/b	5-50 ppm	ND	ND	ND	ND	ND
5) 1,2-Dichloroethane	Methyl bromide 5/b	5-50 ppm	ND	ND	ND	ND	ND

NOTES: 1) ND - Not Detectable

APPENDIX E

CALIBRATION AND MAINTENANCE OF HIGH-VOLUME SAMPLERS

APPENDIX E

ROUTINE CALIBRATION AND MAINTENANCE SCHEDULES

STATION	STOPPED	CALIBRATION	RESTARTED	EXPLANATION TO ACTION TAKEN
P1	June 7	June 7	June 8	Changed brushes
	July 10	July 11	July 12	Motor failed - Changed brushes
	July 13	July 14	July 15	Motor failed - Changed brushes
	July 18	July 19	July 20	Motor failed - Replaced motor
	August 9	August 9	August 10	Changed brushes & environmentally cleaned sampling unit
	September 16	September 16	September 17	Changed brushes
	October 19	October 20	October 21	Motor failed - Changed brushes & armature
P2	June 5	June 6	June 7	Motor failed - Changed brushes
	July 2	--	July 4	Motor failed - Changed brushes
	July 5	July 6	July 7	Power failure - changed fuse
	July 9	July 10	July 11	Motor failed - changed armature
	August 11	August 11	August 12	Unit shut-down w/ MDNR approval. Changed brushes and environmentally cleaned unit

APPENDIX E

ROUTINE CALIBRATION AND MAINTENANCE SCHEDULES

STATION	STOPPED	CALIBRATION	RESTARTED	EXPLANATION TO ACTION TAKEN
P2	September 12	September 12	September 13	Changed brushes
	October 12	October 17	October 18	Motor failed - changed brushes
	November 1	November 2	November 3	Motor failed - replaced motor
P3	June 8	June 8	June 9	Brushes changed
	July 11	July 12	July 13	Motor failed - changed brushes
	August 1	August 2	August 3	Motor failed - changed brushes
	August 11	August 11	August 12	Unit shut-down w/ MDNR approval. Changed brushes and environmentally cleaned unit
	September 13	September 13	September 14	Changed brushes
	October 19	October 19	October 20	Changed brushes
P4	May 17	May 18	May 20	Motor failed - changed motor
	June 15	June 15	June 16	Changed brushes
	July 12	July 13	July 14	Motor failed - changed brushes
	August 11	August 11	August 12	Unit shut-down with MDNR approval. Changed brushes and environmentally cleaned unit

APPENDIX E

ROUTINE CALIBRATION AND MAINTENANCE SCHEDULES

STATION	STOPPED	CALIBRATION	RESTARTED	EXPLANATION TO ACTION TAKEN
P4	August 18	--	August 18	Noticed transducer readings were deviating from normal readings. Recalibrated to 45 CFM
	September 15	September 16	September 17	Motor failed - Changed brushes
	October 1	--	October 4	Motor failed - Changed brushes
	October 17	October 17	October 18	Motor failed - Changed motor
	October 27	October 28	October 29	Motor failed - Changed brushes and armature
	November 7	November 7	November 8	Motor failed - changed brushes
P5	June 13	June 13	June 14	Changed brushes
	July 16	July 16	July 17	Changed brushes
	August 10	August 11	August 12	Motor failed - Changed brushes & environmentally cleaned unit
	September 14	September 14	September 15	Changed brushes
	October 5	--	October 10	Motor failed - Changed motors
	November 8	November 8	November 9	Motor failed - Changed brushes

APPENDIX E

ROUTINE CALIBRATION AND MAINTENANCE SCHEDULES

STATION	STOPPED	CALIBRATION	RESTARTED	EXPLANATION TO ACTION TAKEN
P6	June 12	June 12	June 13	Changed brushes
	June 15	June 16	June 17	Motor failed - changed brushes
	June 25	June 26	July 1	Motor failed - changed brushes Unit failed to respond to field calibration. Was finally adjusted
	July 11	July 12	July 13	Motor failed - fuse in flow controller was replaced
	July 19	July 19	July 20	Motor was replaced due to observation of inconsistent flow data
	August 11	August 11	August 12	Unit shut-down w/ MDNR approval. Changed brushes and environmentally cleaned unit
	September 9	September 10	September 11	Motor failed - Changed brushes
	September 29	September 30	October 1	Motor failed - Changed motor and flow controller
	November 2	November 2	November 3	Changed brushes and flow controller

APPENDIX F

EXPLANATION FOR INCOMPLETE DATA

APPENDIX F

EXPLANATION FOR INCOMPLETE DATA

STATION	DATE	EXPLANATION
P1	05/19/83	No pressure transducer data
	05/21/83	Not operated due to lack of on-site activity
	09/28/83	No TSP data calculated Filter sent to Memphis Environmental Center for chemical analysis
	11/02/83	No pressure transducer data
P2	05/21/83	Not operated due to lack of on-site activity
	07/08/83	Sample voided since 5-plate calibration of motor installed on 07/06/83 took >1 hr.
	09/19/83	Filter torn-sample voided
P3	09/17/83	No pressure transducer data
	09/26/83	No TSP data calculated. Filter sent to Memphis Environmental Center for chemical analysis
P4	07/21/83	MDNR conducted audit on sampling unit shut-down for excessive period of time - sample voided
	09/26/83	No TSP data calculated-filter sent to Memphis Environmental Center for chemical analysis

APPENDIX F

EXPLANATION FOR INCOMPLETE DATA

STATION	DATE	EXPLANATION
P4	10/22/83	No pressure transducer data
	11/02/83	No pressure transducer data
P5	05/16/83	Monitor needed flow controller, which was installed on May 16 and a 5-Plate calibration performed
	05/19/83	No pressure transducer data
	10/06/83	No blank filters available
P6	09/18/83	No pressure transducer data
	10/11/83	No pressure transducer data
ALL	05/22-23/83	Insufficient activities on-site to warrant ambient air monitoring program. All units were calibrated with a loaner oriface unit on 05/23/83
	09/04-05/73	Monitors shut-down for holiday weekend with consent of MDNR-Air Quality Division
	10/06-09/83	Work shut-down due to inclement weather. All monitors discontinued during this period
	10/13-16/83	Work shut-down due to inclement weather. All monitors discontinued during this period
	11/07/83	Ran out of blank filters

APPENDIX G

METEOROLOGICAL DATA

DATE	5-16		5-17		5-18		5-19		5-20		5-21		5-22	
TIME INTERVAL	WS	WD	WS	WD	WS	WD	WS	WD	WS	WD	WS	WD	WS	WD
0000 - 0100	2	N	<1	E	3	S	3	E	3	S	<1	S	2	E
0100 - 0200	1	N	<1	NE	1	S	2	E	3	S	<1	S	1	E
0200 - 0300	1	N	<1	N	<1	E	2	E	3	S	<1	S	1	E
0300 - 0400	1	N	<1	N	<1	E	2	E	1	SW	<1	NE	1	E
0400 - 0500	2	N	<1	N	<1	SE	2	NE	1	SW	<1	S	1	E
0500 - 0600	2	N	<1	NE	<1	E	2	E	1	SW	<1	S	2	NE
0600 - 0700	4	N	<1	SW	<1	E	2	E	1	SW	<1	S	1	NE
0700 - 0800	5	N	<1	N	1	SE	2	E	1	SW	<1	S	1	NE
0800 - 0900	3	N	1	SE	2	SE	3	E	1	SW	<1	SE	3	N
0900 - 1000	3	N	1	SE	3	SE	3	E	2	SW	<1	S	2	N
1000 - 1100	4		1	SE	5	SE	3	E	2	SW	1	S	3	N
1100 - 1200	2	N	1	S	6	SE	4	SE	3	W	3	S	2	N
1200 - 1300	2	N	1	SW	6	SE	5	SE	2	W	1	S	1	N
1300 - 1400	3	N	1	SE	6	SE	2	S	2	SW	1	S	<1	S
1400 - 1500	3	N	1	SE	5	E	5	S	1	SW	2	S	1	SW
1500 - 1600	4	N	1	S	5	E	5	S	2	SW	1	S	2	SW
1600 - 1700	2	NW	2	S	5	E	3	S	2	SW	1	SE	2	SW
1700 - 1800	1	W	2	SE	5	E	4	S	1	SW	2	E	3	SW
1800 - 1900	1	NW	2	S	5	E	5	SW	<1	W	1	E	3	SW
1900 - 2000	<1	NE	2	SE	4	E	6	SW	<1	SW	1	NE	2	SW
2000 - 2100	<1	E	1	SE	2	E	4	SW	<1	SW	1	NE	3	SW
2100 - 2200	<1	3	1	SE	1	E	5	S	<1	S	1	NE	3	SW
2200 - 2300	<1	NE	1	SE	1	E	4	S	1	S	1	E	2	SW
2300 - 0000	<1	NE	2	SE	2	E	3	S	<1	SW	1	E	2	SW

APPENDIX G

METEOROLOGICAL DATA

DATE	5-23		5-24		5-25		5-26		5-27		5-28		5-29	
TIME INTERVAL	WS	WD	WS	WD	WS	WD	WS	WD	WS	WD	WS	WD	WS	WD
0000 - 0100	2	SW	<1	SW	3	S	<1	W	<1	S	<1	SW	3	S
0100 - 0200	2	SW	<1	SW	2	S	<1	W	<1	S	<1	S	3	SE
0200 - 0300	2	W	<1	SW	<1	SW	<1	W	<1	S	<1	SW	3	SE
0300 - 0400	2	W	<1	S	1	S	<1	SW	<1	E	<1	E	3	SE
0400 - 0500	2	W	<1	S	<1	SW	<1	W	<1	S	<1	S	5	SE
0500 - 0600	2	W	<1	S	1	S	1	W	<1	E	<1	E	5	S
0600 - 0700	1	W	<1	SE	1	S	1	W	<1	SW	<1	NW	3	S
0700 - 0800	1	SW	1	S	3	S	2	W	<1	S	<1	NW	3	S
0800 - 0900	2	SW	2	S	3	SW	2	W	1	S	<1	SW	3	S
0900 - 1000	2	W	3	S	4	NW	3	NW	1	S	1	S	2	SW
1000 - 1100	3	W	2	S	2	NW	2	W	2	S	1	S	2	
1100 - 1200	3	W	3	S	3	NW	2	W	2	S	2	S	2	
1200 - 1300	4	W	3	S	4	NS	3	W	3	S	3	S	3	SW
1300 - 1400	3	W	3	SW	4	NW	2	W	2	S	3	S	3	W
1400 - 1500	4	W	3	SW	5	NW	3	NW	2	S	3	S	3	W
1500 - 1600	3	W	4	SW	4	W	3	NW	1	S	3	SE	3	W
1600 - 1700	4	W	5	SW	4	NW	4	NW	1	SW	4	S	2	W
1700 - 1800	3	W	4	SW	4	NW	4	NW	2	SW	4	S	1	SW
1800 - 1900	3	W	3	S	3	NW	4	N	1	SW	2	S	1	SW
1900 - 2000	2	NW	4	S	3	W	2	NW	1	SW	2	S	2	SW
2000 - 2100	<1	W	4	S	1	NW	2	N	1	SW	1	S	4	S
2100 - 2200	<1	W	3	S	2	NW	2	N	<1	SW	2	S	1	SW
2200 - 2300	<1	W	3	S	2	NW	1		<1	SW	2	S	2	SW
2300 - 0000	<1	SW	2	SW	2	NW	<1		<1	SW	3	S	3	S

APPENDIX G

METEOROLOGICAL DATA

DATE	5-30		5-31		6-1		6-2		6-3		6-4		6-5	
TIME INTERVAL	WS	WD	WS	WD	WS	WD	WS	WD	WS	WD	WS	WD	WS	WD
0000 - 0100	3	S	3	S	<1	W	<1	SW	<1	S	<1		<1	S
0100 - 0200	2	S	3	S	<1	W	<1	SW	<1	S	<1		<1	S
0200 - 0300	3	S	2	S	<1	W	<1	SW	<1	SE	<1		<1	N
0300 - 0400	3	S	3	S	<1	W	<1	S	<1	SE	<1		<1	N
0400 - 0500	3	S	2	2	<1	W	<1	S	<1	SE	1	N	<1	S
0500 - 0600	3	S	<1	SW	<1	W	<1	S	<1	N	<1	N	<1	S
0600 - 0700	3	S	<1	W	<1	NW	<1	S	<1	E	<1	NW	<1	S
0700 - 0800	4	S	<1	W	<1	W	<1	S	<1	E	<1	W	<1	W
0800 - 0900	3	S	<1	W	<1	NW	1	S	<1	SE	<1	W	<1	W
0900 - 1000	4	S	1	W	<1	NW	1	S	3	SE	<1	NW	<1	W
1000 - 1100	4	S	2	W	2	NW	7	S	3	E	<1	W	<1	NW
1100 - 1200	5	S	2	W	<1	W	7	S	1	E	<1	W	<1	W
1200 - 1300	2	SW	2	SW	1	NW	5	S	1	E	4	N	<1	W
1300 - 1400	2	S	3	SW	<1	SE	2	S	<1	E	2	N	<1	W
1400 - 1500	3	S	2	SW	2	SE	1	SW	<1	NE	2	N	<1	W
1500 - 1600	3	SW	3	SW	1	S	<1	SW	1	NE	<1	N	<1	W
1600 - 1700	2	SW	2	W	5	S	<1	W	5	NE	<1	SE	1	W
1700 - 1800	2	SW	2	W	4	S	3	SW	4	E	<1	SE	<1	W
1800 - 1900	3	S	1	SW	5	S	10	SW	5	E	3	S	<1	W
1900 - 2000	3	S	1	SW	5	S	4	SW	3	E	2	S	<1	NW
2000 - 2100	4	S	<1	W	5	S	4	S	<1	E	4	S	<1	NW
2100 - 2200	2	S	<1	W	5	S	<1	SW	<1	E	5	S	<1	N
2200 - 2300	2	S	<1	W	3	S	<1	SW	<1		<1	NE	7	N
2300 - 0000	4	S	<1	SW	2	S	<1	S	<1		<1	NE	5	

APPENDIX G

METEOROLOGICAL DATA

DATE	6-6		6-7		6-8		6-9		6-10		6-11		6-12	
TIME INTERVAL	WS	WD	WS	WD	WS	WD	WS	WD	WS	WD	WS	WD	WS	WD
0000 - 0100	2	N	12	SW	<1	N	5	S	2	S	1	N	<1	S
0100 - 0200	2	N	13	SW	<1	NE	5	S	<1	S	1	N	<1	S
0200 - 0300	2	N	10	SW	2	E	8	SE	<1	S	<1	N	<1	S
0300 - 0400	1	N	7	SW	<1	E	8	SE	<1	NW	<1		<1	S
0400 - 0500	1		S	SW	<1	NE	6	SE	<1	SE	<1		<1	S
0500 - 0600	<1		3	SW	<1	N	4	SE	<1	NW	<1		<1	S
0600 - 0700	<1		<1	SW	<1		4	SE	2	N	<1	SE	<1	S
0700 - 0800	<1	N	<1	SW	2	SE	3	S	2	N	<1	SE	1	S
0800 - 0900	<1	N	<1	W	2	SE	4	S	2	N	1	SE	2	S
0900 - 1000	<1	E	<1	NW	2	SE	5	S	2	N	1	SW	1	S
1000 - 1100	<1	S	2	NW	5	SE	5	S	2		2	SW	1	S
1100 - 1200	<1	S	2	NW	5	SE	5	S	1		2	SW	3	S
1200 - 1300	<1	SW	5	NW	5	SE	10	S	1	S	3	SW	5	S
1300 - 1400	<1	SW	4	NW	5	SE	10	S	1	S	5	S	5	S
1400 - 1500	<1	SW	2	NW	5	SE	10	S	2	S	5	S	5	S
1500 - 1600	<1	SW	2	NW	5	SE	10	S	<1	S	5	S	5	S
1600 - 1700	<1	SW	2	NW	5	SE	8	SW	1	SE	3	S	5	S
1700 - 1800	1	W	2	NW	5	SE	8	SW	1	SE	3	SW	3	S
1800 - 1900	1	W	1	NW	5	SE	4	SW	<1	SE	2	SW	2	S
1900 - 2000	<1	W	1	NW	2	SE	2	SW	1	SE	1	S	1	S
2000 - 2100	<1	SW	8		5	SE	<1	SW	2	SE	<1	S	<1	SE
2100 - 2200	3	S	4	N	5	SE	2	S	<1	NE	<1	S	<1	S
2200 - 2300	7	SW	3	N	5	SE	<1	S	1	N	<1	S	<1	SW
2300 - 0000	10	SW	<1	N	5	SE	<1	S	1	N	<1	S	<1	SE

APPENDIX G

METEOROLOGICAL DATA

DATE	6-13		6-14		6-15		6-16		6-17		6-18		6-19	
TIME INTERVAL	WS	WD	WS	WD	WS	WD	WS	WD	WS	WD	WS	WD	WS	WD
0000 - 0100	<1	SW	3	S	3	S	<1	S	<1	S	3	N	<1	NW
0100 - 0200	<1	S	2	S	<1	SW	<1	SW	<1	S	2	N	<1	N
0200 - 0300	<1	S	1	S	<1	SW	<1	SE	<1	SE	<1	N	<1	N
0300 - 0400	<1	S	<1	S	<1	S	<1	SE	<1	SW	<1	N	<1	N
0400 - 0500	<1	S	<1	S	<1	S	2	S	<1	S	1	N	<1	N
0500 - 0600	<1	S	<1	S	<1	S	3	S	<1	SW	3		<1	N
0600 - 0700	<1	S	1	S	1	S	4	S	<1	S	2		<1	N
0700 - 0800	2	S	2	S	4	S	4	S	<1	N	3	N	<1	N
0800 - 0900	1	S	1	S	2	SW	<1	SW	<1	SE	3	N	<1	N
0900 - 1000	<1	SW	<1	S	2	SW	<1	SW	<1	SE	4	N	2	N
1000 - 1100	<1	SW	<1	S	1	SW	<1	W	<1	S	5	N	2	N
1100 - 1200	1	S	2	S	4	S	<1	W	<1	S	2	N	3	NE
1200 - 1300	2	S	5	S	4	S	1	SW	<1	SW	2	N	1	NE
1300 - 1400	3	S	5	S	5	S	<1	SW	<1	SW	1	N	2	N
1400 - 1500	2	S	7	S	2	SW	5	SW	<1	W	<1	N	1	N
1500 - 1600	2	S	7	S	2	SW	3	SW	<1	W	<1	N	2	N
1600 - 1700	3	S	8	S	1	SW	2	SW	<1		<1	N	2	N
1700 - 1800	3	S	7	S	<1	SW	1	SW	<1	W	1	N	3	NE
1800 - 1900	2	S	7	S	4	SW	<1	W	1	W	2	N	3	NE
1900 - 2000	<1	S	5	S	<1	SW	<1	W	<1	W	2	N	2	NE
2000 - 2100	<1	SE	<1	S	<1	S	<1	SW	<1	NW	<1	N	<1	
2100 - 2200	<1	SE	<1	SE	<1	S	<1	SW	<1	NW	<1	NE	2	N
2200 - 2300	<1	S	2	SE	<1	S	<1	SW	2	N	<1	NE	<1	N
2300 - 0000	<1	S	3	SE	<1	SE	<1	W	3	N	<1	NE	<1	

APPENDIX G

METEOROLOGICAL DATA

DATE	6-20		6-21		6-22		6-23		6-24		6-25		6-26	
TIME INTERVAL	WS	WD	WS	WD	WS	WD	WS	WD	WS	WD	WS	WD	WS	WD
0000 - 0100	<1		<1	NE	<1	S	<1	S	2	N	<1	N	1	SW
0100 - 0200	<1		<1	E	<1	S	<1	S	<1	N	<1	N	<1	SW
0200 - 0300	<1	N	<1	SE	<1	S	<1	S	<1	N	<1	N	<1	SW
0300 - 0400	<1	N	<1	SE	<1	S	<1	S	<1	N	<1	N	2	S
0400 - 0500	1	N	<1	E	<1	S	<1	S	<1	N	<1	N	3	S
0500 - 0600	1	N	<1	N	<1	S	2	S	<1	N	<1	N	3	S
0600 - 0700	1	N	<1	N	<1	S	3	S	<1	N	<1	N	3	S
0700 - 0800	2	N	<1	SE	<1	S	2	S	<1	NE	<1	N	2	SW
0800 - 0900	2	N	<1	SE	<1	S	2	S	1	N	<1	N	2	S
0900 - 1000	2	N	<1	SE	1	SE	2	S	3	N	<1	NW	<1	S
1000 - 1100	2	NE	<1	SE	1	SE	1	SW	4	N	2	N	<1	S
1100 - 1200	3	NE	<1	SE	1	SE	1	SW	4	N	2	N	<1	SE
1200 - 1300	3	E	1	SE	3	SE	1	W	3	N	3	N	<1	SW
1300 - 1400	3	SE	2	SE	3	SE	1	W	2	NW	<1	NE	<1	N
1400 - 1500	3		2	SE	3	SE	<1	W	2	NW	<1	SE	<1	SE
1500 - 1600	2		1	SE	2	S	<1	W	3	NW	<1	NW	<1	N
1600 - 1700	2		2	SE	3	S	<1	W	2	NW	<1	S	<1	N
1700 - 1800	2		2	SE	2	S	<1	NW	2	NW	<1	NW		
1800 - 1900	4	N	2	SE	2	S	<1	NW	2	NW	1	N		
1900 - 2000	4	N	3	SE	1	S	4	N	2	NW	1	N		
2000 - 2100	2	N	1	SE	<1	SW	5	N	3	N	1	N		
2100 - 2200	2	N	<1	SE	<1	NE	4	N	3	N	<1	NE		
2200 - 2300	1	N	<1	S	<1	S	2	N	<1	N	<1	NE		
2300 - 0000	1	N	<1	S	<1	S	3	N	<1	NW	<1	SE		

APPENDIX G

METEOROLOGICAL DATA

DATE	6-27		6-28		6-29		6-30		7-1		7-2		7-3	
TIME INTERVAL	WS	WD	WS	WD	WS	WD	WS	WD	WS	WD	WS	WD	WS	WD
0000 - 0100			6	N					5	S	<1	S	3	S
0100 - 0200			6	N					4	S	<1	SW	5	S
0200 - 0300			6	N					4	S	<1	W	10	S
0300 - 0400			6	N					1	SW	<1	SW	10	S
0400 - 0500			5	N					3	W	<1	SW		
0500 - 0600			5	N					3	SW	<1	S		
0600 - 0700			5	N					5	SW	3	SW		
0700 - 0800			5	N					<1	SW	1	SW		
0800 - 0900			4	N					<1	W	2	SW		
0900 - 1000			3	N					1	SW	2	SW		
1000 - 1100			2	N					<1	SW	2	SW		
1100 - 1200			2	N					2	SW	2	SW		
1200 - 1300			1	N					3	SW	3	S		
1300 - 1400			1	N					2	SW	3	S		
1400 - 1500			1	N					<1	SW	<1	SE		
1500 - 1600			2	N					<1	SE	2	SE		
1600 - 1700			1	N					<1	SE	3	SE		
1700 - 1800			1	N					<1	SW	4	SE		
1800 - 1900			<1	N					<1	SW	4	S		
1900 - 2000	5	N	<1	N					<1	S	5	S		
2000 - 2100	6	N	1	N					<1	S	5	S		
2100 - 2200	6	N	1	NE					<1	S	5	S		
2200 - 2300	6	N	2	NE					<1	S	3	S		
2300 - 0000	7	N	3	E					<1	S	1	S		

METEOROLOGICAL DATA

DATE	7-4		7-5		7-6		7-7		7-8		7-9		7-10	
TIME INTERVAL	WS	WD	WS	WD	WS	WD	WS	WD	WS	WD	WS	WD	WS	WD
0000 - 0100					3	N	0		1	S	2	S	2	N
0100 - 0200					3	N	0		2	S	2	S	1	N
0200 - 0300					2	N	<1	S	3	S	<1	S	2	N
0300 - 0400					<1	N	<1	S	2	S	<1	N	2	N
0400 - 0500					<1	N	<1	S	7	S	0		1	N
0500 - 0600					<1	N	<1	S	5	S	0		1	N
0600 - 0700					<1	N	<1	S	4	S	<1	N	<1	N
0700 - 0800					1	NW	<1	S	4	S	1	N	<1	E
0800 - 0900			3	NW	3	N	<1	S			2	N	<1	SE
0900 - 1000			7	NW	4	N	4	S			2	NE	4	SE
1000 - 1100			6	NW	2	W	4	S	2	SW	3	NE	4	SE
1100 - 1200			6	NW	1	W	4	S	6	SW	3	N	3	SE
1200 - 1300			7	NW	1	NW	5	S	2	SW	5	N	4	SE
1300 - 1400			6	NW	1	W	5	S	3	SW	5	N	4	S
1400 - 1500			4	NW	2	NW	6	S	5	SW	4	N	3	S
1500 - 1600			6	NW	2	S	4	SW	3	SW	6	N	3	SE
1600 - 1700			5	NW	2	S	4	SW	2	SW	5	N	2	SE
1700 - 1800			3	NW	1	W	3	SW	3	SW	5	N	2	SW
1800 - 1900			4	NW	1	W	2	SW	2	SW	4	N	<1	SW
1900 - 2000			2	NW	<1	W	1	SW	5	SW	4	N	1	S
2000 - 2100			2	NW	0		1	S	6	SW	2	NE	1	SE
2100 - 2200			3	NW	0		2	S	<1	SW	2	NE	<1	SE
2200 - 2300			3	NW	<1	S	2	S	<1	SW	2	N	1	SE
2300 - 0000			3	N	<1	S	2	S	2	S	2	N	2	S

APPENDIX G

METEOROLOGICAL DATA

DATE	7-11		7-12		7-13		7-14		7-15		7-16		7-17	
TIME INTERVAL	WS	WD	WS	WD	WS	WD	WS	WD	WS	WD	WS	WD	WS	WD
0000 - 0100	2	S	5	S	<1	NW	<1	SW	<1	SW			<1	SW
0100 - 0200	1	S	3	S	0		<1	S	<1	SW	<1	W	<1	SW
0200 - 0300	3	S	3	SW	0		<1	S	<1	SW	<1	W	<1	SW
0300 - 0400	4	S	3	SW	<1	S	<1	S	<1	SW	<1	W	<1	SW
0400 - 0500	4	S	2	S	<1	S	1	S	1	SW	<1	SW	2	S
0500 - 0600	3	S	<1	SW	<1	S	1	S	<1	SW	<1	SW	2	S
0600 - 0700	3	S	0		<1	S	2	S	<1	SW	0		2	S
0700 - 0800	3	S	<1	W	<1	S	3	S	<1	SW	0		3	S
0800 - 0900	5	S	4	NW	<1	W	3	S	0		<1	SW	1	SW
0900 - 1000	5	S	5	NW	<1	W	3	S	<1	W	1	W	1	SW
1000 - 1100	4	SW	1	NW	<1	W	6	S	<1	W	1	W	1	W
1100 - 1200	3	SW	1	W	<1	W	3	SW	1	W	1	W	1	W
1200 - 1300	5	SW	1	W	<1	SW	1	SW	2	SW	1	W	1	W
1300 - 1400	4	SW	2	W	2	SW	1	W	2	W	1	SW	3	W
1400 - 1500	4	SW	2	W	3	S	2	W	2	W	2	SW	2	W
1500 - 1600	6	SW	1	W	1	S	2	W	2	W	1	W	2	W
1600 - 1700	5	SW	2	W	3	S	2	W	1	W	2	SW	1	W
1700 - 1800	3	SW	2	W	1	SW	2	W	2	W	2	W	2	W
1800 - 1900	3	SW	1	W	2	SW	2	SW	2	W	1	SW	2	W
1900 - 2000	2	SW	1	W	2	SW	1	SW	2	W	2	SW	2	W
2000 - 2100	3	SW	<1	W	<1	SW	<1	SW	1	SW	2	SW	<1	W
2100 - 2200	3	S	<1	W	<1	SW	0		<1	SW	<1	SW	<1	W
2200 - 2300	3	S	<1	W	0		0		0		0		<1	W
2300 - 0000	5	S	<1	W	<1	SW	<1	SW	0		0		<1	W

APPENDIX G

METEOROLOGICAL DATA

DATE	7-18		7-19		7-20		7-21		7-22		7-23		7-24	
TIME INTERVAL	WS	WD	WS	WD	WS	WD	WS	WD	WS	WD	WS	WD	WS	WD
0000 - 0100	<1	W	<1	E	<1	W	<1	NW	1	NE	1	E	1	NW
0100 - 0200	<1	NW	<1	E	2	SW	<1	W	2	NE	2	SE	1	NW
0200 - 0300	<1	NW	0		2	SW	0		1	NE	2	SE	<1	NW
0300 - 0400	<1	NW	0		3	S	0		1	NE	3	SE	0	
0400 - 0500	0		0		0		0		<1	NE	3	SE	0	
0500 - 0600	0		0		0		0		<1	NE	2	SE	0	
0600 - 0700	<1	N	<1	W	<1	SW	<1	SW	<1	N	1	SE	0	
0700 - 0800	<1	N	<1	N	<1	SW	<1	SW	1	E	1	E	<1	NW
0800 - 0900	<1	N	<1	NW	<1	W	<1	SW	3	E	1	SE	4	NW
0900 - 1000	0		2	N	2	W	<1	S	5	SE	1	S	4	NW
1000 - 1100	6	N	4	N	1	NW	1	S	5	SE	<1	S	3	N
1100 - 1200	3	N	3	NW	1	W	2	S	5	SE	<1	S	5	N
1200 - 1300	2	S	3	NW	1	SW	10	S	4	E	2	SW	4	N
1300 - 1400	6	S	1	NW	2	W	10	N	3	E	2	S	3	N
1400 - 1500	5	S	1	W	2	W	2	N	5	E	3	SW	4	N
1500 - 1600	5	S	1	W	2	W	8	N	6	E	3	W	4	N
1600 - 1700	2	SW	3	NW	1	W	8	N	5	E	4	W	5	N
1700 - 1800	1	W	2	W	1	W	7	N	6	E	2	W	5	N
1800 - 1900	1	W	1	W	1	W	5	N	4	E	2	W	4	N
1900 - 2000	1	NW	1	W	<1	W	7	N	3	E	2	W	5	N
2000 - 2100	0		0		<1	W	3	N	2	E	<1	W	3	N
2100 - 2200	0		0		0		3	N	2	E	<1	W	2	N
2200 - 2300	4	W	0		0		4	NE	2	NE	<1	SW	2	N
2300 - 0000	0		0		<1	W	2	NE	1	E	<1	W	1	N

APPENDIX G

METEOROLOGICAL DATA

DATE	7-25		7-26		7-27		7-28		7-29		7-30		7-31	
TIME INTERVAL	WS	WD	WS	WD	WS	WD	WS	WD	WS	WD	WS	WD	WS	WD
0000 - 0100	<1	N	4	N			3	S	0		<1	SW	<1	NE
0100 - 0200	<1	N	2	N			4	S	1	S	0		<1	N
0200 - 0300	0		0				4	S	9	S	<1	SW	1	N
0300 - 0400	0		0				3	S	2	S	0		0	
0400 - 0500	<1	N	0				3	S	2	S	0		<1	NE
0500 - 0600	2	N	3	N			2	S	3	S	2	N	1	NE
0600 - 0700	1	N	1	N			1	S	1	S	<1	N	<1	E
0700 - 0800	1	N	1	N			2	S	2	S	<1	N	1	SE
0800 - 0900	3	N	1	N	2	S	6	S	1	S	2	N	1	SW
0900 - 1000	3	N	1	N	2	S	7	S	1	S	2	N	2	S
1000 - 1100	6	N	1	N	3	S	8	S	1	S	<2	E	4	S
1100 - 1200	2	NE	2	N	4	S	9	S	1	S	<2	E	6	S
1200 - 1300	6	N	2	NE	2	S	8	S	2	SE	2	N	6	S
1300 - 1400	6	N	1	S	3	S	9	S	3	S	2	N	3	S
1400 - 1500	5	N	2	NE	3	S	8	S	3	S	2	NE	3	S
1500 - 1600	7	NE	2	NE	4	S	4	SW	4	S	3	NE	4	S
1600 - 1700	8	N	1	S	3	S	3	SW	3	SW	2	E	6	S
1700 - 1800	6	N	3	NE	4	S	1	SW	1	W	2	E	5	SW
1800 - 1900	6	N	3	SE	5	S	1	S	1	W	3	E	4	SW
1900 - 2000	3	N	2	NE	3	S	2	SE	1	W	2	E	5	SW
2000 - 2100	2	NE	2	E	2	S	1	SE	<1	W	2	SE	3	SW
2100 - 2200	2	SE	2	SE	1	S	0		<1	W	<1	SE	2	SW
2200 - 2300	5	NE	2	SE	1	S	0		0		<1	E	1	S
2300 - 0000	5	N	1	SE	2	S	0		0		2	N	0	

METEOROLOGICAL DATA

DATE	8-1		8-2		8-3		8-4		8-5		8-6		8-7	
TIME INTERVAL	WS	WD	WS	WD	WS	WD	WS	WD	WS	WD	WS	WD	WS	WD
0000 - 0100			<1	NW	<1	S	2	SW	<1	N	<1	S	<1	NW
0100 - 0200			<1	W	<1	S	<1	S	1	N	<1	S	1	NW
0200 - 0300			<1	W	2	S	<1	S	<1	N	<1	S	2	N
0300 - 0400			<1	W	2	S	<1	SW	2	N	<1	SW	2	N
0400 - 0500			0		2	S	<1	SW	3	N	<1	SW	1	N
0500 - 0600			0		3	S	0		3	N	<1	SW	0	
0600 - 0700			0		3	S	<1	NW	3	N	<1	SW	0	
0700 - 0800			1	N	5	S	4	N	4	N	0		3	N
0800 - 0900			4	N	6	S	6	N	3	N	0		3	N
0900 - 1000			4	N	9	S	6	N	5	N	1	S	1	NW
1000 - 1100	2	W	1	N	9	S	4	N	6	N	1	SW	1	NW
1100 - 1200	2	W	1	NE	8	S	4	N	3	N	2	W	2	NW
1200 - 1300	3	W	1	W	6	S	3	N	3	N	1	W	3	NW
1300 - 1400	2	W	2	NE	5	S	4	N	1	NE	1	SW	3	NW
1400 - 1500	1	W	3	E	6	S	2	N	<1	N	2	SW	3	W
1500 - 1600	2	W	3	E	5	S	6	N	1	N	1	SW	3	N
1600 - 1700	3	W	2	E	4	S	4	N	1	NE	2	SW	1	S
1700 - 1800	1	W	2	SE	4	S	7	N	2	NE	1	SW	3	S
1800 - 1900	1	W	1	SE	1	S	7	N	1	E	1	W	1	SW
1900 - 2000	1	W	1	SE	3	S	6	N	<1	E	<1	W	<1	SW
2000 - 2100	<1	W	<1	SE	4	S	3	N	<1	E	<1	W	<1	SW
2100 - 2200	<1	W	0		3	S	4	N	0		<1	W	<1	SW
2200 - 2300	<1	W	<1	SE	3	S	3	N	<1	S	<1	W	<1	SW
2300 - 0000	1	NW	<1	S	4	S	3	N	<1	S	<1	W	2	SW

APPENDIX G

METEOROLOGICAL DATA

DATE	8-8		8-9		8-10		8-11		8-12		8-13		8-14	
TIME INTERVAL	WS	WD	WS	WD	WS	WD	WS	WD	WS	WD	WS	WD	WS	WD
0000 - 0100	3	SW	4	NW	1	NE	4	SE	<1	N	<1	N	<1	S
0100 - 0200	3	SW	1	NW	<1	NE	3	N	1	N	<1	N	<1	S
0200 - 0300	4	SW	<1	N	<1	NE	3	N	2	N	0		1	S
0300 - 0400	3	SW	<1	N	<1	NE	2	NE	2	N	<1	S	2	S
0400 - 0500	4	SW	<1	MW	<1	E	2	NE	2	N	<1	S	2	S
0500 - 0600	4	SW	<1	NW	<1	E	2	NE	2	N	<1	S	3	S
0600 - 0700	4	SW	<1	NW	<1	E	3	N	2	N	<1	S	3	S
0700 - 0800	5	SW	4	N	<1	E	1	N	1	N	<1	SE	3	S
0800 - 0900	3	SW	6	N	<1	E	<1	W	2	N	2	S	3	S
0900 - 1000	3	SW	6	N	2	E	<1	W	4	N	3	S	5	S
1000 - 1100	3	SW	6	N	1	SE	<1	NW	4	N	3	S	3	S
1100 - 1200	3	SW	5	N	1	E	5	N	5	N	3	S	3	S
1200 - 1300	3	SW	4	N	1	E	10	N	5	N	2	S	3	S
1300 - 1400	3	W	4	N	2	E	9	N	3	N	4	S	3	S
1400 - 1500	3	W	4	N	1	E	9	N	3	N	4	S	4	S
1500 - 1600	2	W	4	N	2	E	10	N	3	N	3	S	3	S
1600 - 1700	2	NW	5	N	3	E	11	N	3	E	3	S	3	S
1700 - 1800	11	NW	3	NE	4	SE	9	N	2	E	4	S	<1	S
1800 - 1900	8	NW	3	NE	5	SE	9	N	2	E	3	S	2	S
1900 - 2000	4	NW	4	NE	5	SE	7	N	<1	E	2	S	3	S
2000 - 2100	3	NW	3	N	5	SE	4	N	<1	E	1	S	<1	S
2100 - 2200	3	NW	3	N	5	SE	2	N	<1	SE	<1	S	<1	S
2200 - 2300	1	NW	2	N	4	SE	3	N	0		<1	S	<1	S
2300 - 0000	4	NW	1	N	4	SE	3	N	<1	NE	<1	S	<1	S

APPENDIX G

METEOROLOGICAL DATA

DATE	8-15		8-16		8-17		8-18		8-19		8-20		8-21	
TIME INTERVAL	WS	WD	WS	WD	WS	WD	WS	WD	WS	WD	WS	WD	WS	WD
0000 - 0100	<1	S	<1	S	1	S	<1	SE	<1	S	2	S	2	N
0100 - 0200	1	S	<1	S	2	S	<1	SE	<1	S	1	SW	3	N
0200 - 0300	1	S	2	S	2	S	<1	SE	<1	S	1	SW	2	N
0300 - 0400	2	S	2	S	3	S	<1	E	<1	S	<1	W	2	NE
0400 - 0500	2	S	2	S	4	S	<1	N	1	S	<1	NW	2	E
0500 - 0600	2	S	2	S	3	S	2	N	1	S	2	NW	<1	E
0600 - 0700	2	S	3	S	3	S	3	N	2	S	1	NW	<1	N
0700 - 0800	2	S	4	S	5	S	2	N	1	S	<1	NW	<1	NE
0800 - 0900	2	S	3	S	6	S	3	N	3	S	<1	NW	2	E
0900 - 1000	2	S	3	S	5	S	7	N	4	S	1	NW	2	SE
1000 - 1100	1	S	4	S	4	S	5	N	8	S	5	N	5	SE
1100 - 1200	2	S	3	S	1	SW	3	N	10	S	3	N	5	SE
1200 - 1300	3	S	3	S	1	SW	3	N	8	S	1	NW	5	SE
1300 - 1400	3	S	3	S	1	SW	2	N	6	S	1	W	6	S
1400 - 1500	3	S	3	S	1	SW	1	NW	5	S	2	W	6	S
1500 - 1600	2	S	5	S	1	W	2	N	5	SW	2	NW	5	SE
1600 - 1700	2	S	3	S	<1	W	2	N	6	SW	3	NW	3	SE
1700 - 1800	3	S	3	S	<1	W	2	N	3	SW	4	NW	2	E
1800 - 1900	3	S	2	S	<1	W	1	E	2	SW	3	N	2	SE
1900 - 2000	2	S	2	S	0		1	E	3	SW	5	N	2	E
2000 - 2100	2	S	1	S	<1	SW	2	E	4	SW	3	N	4	SE
2100 - 2200	1	S	<1	S	<1	SW	<1	SE	3	SW	2	N	3	S
2200 - 2300	<1	S	1	S	<1	SW	1	S	2	SW	1	N	4	SE
2300 - 0000	<1	S	1	S	<1	SW	<1	SE	<1	SW	2	N	2	SE

APPENDIX G

METEOROLOGICAL DATA

DATE	8-22		8-23		8-24		8-25		8-26		8-27		8-28	
TIME INTERVAL	WS	WD	WS	WD	WS	WD	WS	WD	WS	WD	WS	WD	WS	WD
0000 - 0100	3	S	1	N	<1	N	1	N	<1	S	<1	S	<1	NW
0100 - 0200	3	S	2	N	<1	N	<1	N	<1	S	<1	S	<1	NW
0200 - 0300	4	S	2	N	<1	N	<1	E	<1	S	<1	S	2	N
0300 - 0400	1	SW	3	N	1	N	<1	E	<1	N	0		4	N
0400 - 0500	1	SW	4	N	1	N	<1	E	<1	N	0		1	N
0500 - 0600	1	SW	2	N	1	N	<1	E	<1	N	<1	S	1	N
0600 - 0700	<1	W	1	N	2	N	<1	E	<1	S	<1	S	1	N
0700 - 0800	<1	W	<1	N	2	N	<1	E	<1	S	<1	SE	3	N
0800 - 0900	1	NW	3	N	1	N	<1	SE	0		1	S	1	N
0900 - 1000	3	NW	3	N	1	S	2	SE	0		1	S	1	N
1000 - 1100	2	NW	3	N	2	S	2	SE	<1	SW	2	S	1	N
1100 - 1200	2	NW	1	N	3	SE	2	SE	1	SW	1	S	1	NW
1200 - 1300	2	NW	2	N	2	SE	3	SE	2	SW	1	S	2	N
1300 - 1400	1	NW	3	NE	3	SE	2	SE	1	W	1	SW	3	N
1400 - 1500	2	W	2	NE	3	SE	2	SE	<1	W	1	W	4	N
1500 - 1600	1	W	1	W	3	SE	3	SE	1	W	2	NW	3	N
1600 - 1700	1	W	1	W	3	SE	3	S	1	W	1	NW	3	N
1700 - 1800	3	NW	1	S	2	SE	3	S	2	W	2	NW	2	N
1800 - 1900	3	NW	1	E	2	SE	1	SE	1	W	<1	W	2	N
1900 - 2000	2	NW	1	E	2	SE	<1	E	<1	W	1	NW	2	N
2000 - 2100	<1	NW	<1	E	<1	E	<1	S	<1	W	<1	NW	1	N
2100 - 2200	1	NW	<1	E	<1	E	<1	S	0		<1	NW	<1	N
2200 - 2300	1	N	<1	E	<1	E	<1	S	1	S	<1	NW	<1	N
2300 - 0000	1	N	<1	E	<1	NE	<1	S	<1	N	<1	NW	0	

APPENDIX G

METEOROLOGICAL DATA

DATE	8-29		8-30		8-31		9-1		9-2		9-3		9-4	
TIME INTERVAL	WS	WD	WS	WD	WS	WD	WS	WD	WS	WD	WS	WD	WS	WD
0000 - 0100	0		2	S	<1	NW	<1	N	<1	S	<1	S	<1	S
0100 - 0200	0		2	SW	<1	NW	<1	N	<1	S	<1	S	2	S
0200 - 0300	0		1	SW	2	NW	<1	NW	<1	S	<1	S	2	S
0300 - 0400	0		1	SW	2	NW	<1	NW	<1	S	<1	S	2	S
0400 - 0500	0		<1	SW	5	N	<1	NW	<1	S	2	S	2	S
0500 - 0600	<1	S	1	SW	6	N	<1	NW	1	S	2	S	2	S
0600 - 0700	<1	S	3	W	4	N	<1	NW	1	S	1	S	1	S
0700 - 0800	<1	S	3	NW	4	N	<1	N	2	S	3	S	3	S
0800 - 0900	<1	S	<1	SW	4	N	<1	N	3	S	3	S	4	S
0900 - 1000	<1	SW	<1	W	5	N	<1	N	3	SW	3	S	4	S
1000 - 1100	<1	SW	1	SW	5	N	1	SE	3	SW	3	S	4	S
1100 - 1200	1	W	1	NW	3	N	1	SE	4	SW	3	S	6	S
1200 - 1300	1	W	2	S	3	N	2	S	4	SW	4	S	7	S
1300 - 1400	1	W	3	S	4	N	2	NE	5	SW	3	S	8	S
1400 - 1500	1	NW	3	S	4	N	2	N	4	S	4	S	7	S
1500 - 1600	3	SW	<1	W	3	N	2	N	4	S	5	S	7	S
1600 - 1700	2	SW	<1	W	4	N	2	NW	4	S	5	S	5	S
1700 - 1800	3	SW	<1	W	4	N	1	NW	2	S	4	S	4	S
1800 - 1900	2	SW	<1	W	3	NE	3	SE	2	S	3	S	4	S
1900 - 2000	<1	SW	<1	W	2	NE	<1	SE	<1	S	2	S	2	S
2000 - 2100	<1	SW	<1	W	1	N	0		<1	S	<1	S	<1	S
2100 - 2200	<1	S	<1	W	1	N	0		<1	S	<1	S	<1	S
2200 - 2300	2	S	<1	W	<1	N	0		<1	S	<1	S	<1	S
2300 - 0000	2	S	<1	W	<1	N	<1	S	<1	S	<1	S	<1	S

APPENDIX G

METEOROLOGICAL DATA

DATE	9-5		9-6		9-7		9-8		9-9		9-10		9-11	
TIME INTERVAL	WS	WD	WS	WD	WS	WD	WS	WD	WS	WD	WS	WD	WS	WD
0000 - 0100	1	S	10	S	1	S	<1	S	2	S	2	SW	<1	SW
0100 - 0200	3	S	11	S	2	S	<1	S	3	S	2	SW	<1	W
0200 - 0300	3	S	10	S	2	S	<1	N	6	S	3	SW	<1	W
0300 - 0400	3	S	8	S	1	W	<1	S	5	S	3	S	<1	W
0400 - 0500	3	S	6	S	<1	W	<1	S	3	S	2	S	<1	W
0500 - 0600	4	S	1	SW	<1	W	<1	S	3	S	3	S	<1	W
0600 - 0700	4	S	2	SE	<1	W	<1	S	3	S	3	S	<1	W
0700 - 0800	5	S	1	S	<1	W	<1	S	3	S	3	S	<1	W
0800 - 0900	5	S	1	SW	<1	W	1	S	7	S	4	S	<1	W
0900 - 1000	8	S	3	SW	<1	W	2	S	7	S	3	SW	<1	NW
1000 - 1100	8	S	3	SW	3	W	2	S	5	S	4	SW	1	NW
1100 - 1200	10	S	4	SW	1	W	3	S	7	S	5	SW	1	W
1200 - 1300	11	S	4	SW	1	W	2	S	8	S	5	SW	1	W
1300 - 1400	12	S	3	SW	1	W	3	S	10	S	6	SW	1	W
1400 - 1500	10	S	3	SW	1	W	3	S	5	SW	6	SW	1	SW
1500 - 1600	11	S	3	SW	1	SW	3	S	5	SW	5	SW	2	SW
1600 - 1700	11	S	3	W	1	W	3	S	5	SW	4	SW	2	SW
1700 - 1800	10	S	4	SW	<1	W	3	S	6	SW	5	SW	1	W
1800 - 1900	8	S	3	SW	<1	W	4	S	5	SW	4	SW	<1	W
1900 - 2000	5	S	<1	W	<1	W	1	S	4	SW	2	SW	<1	W
2000 - 2100	5	S	0		<1	W	1	S	5	SW	1	SW	<1	W
2100 - 2200	5	S	<1	SW	<1	SW	2	S	4	SW	1	SW	<1	W
2200 - 2300	7	S	<1	S	<1	W	1	S	3	S	<1	SW	<1	NW
2300 - 0000	6	S	<1	W	<1	W	2	S	3	S	<1	SW	<1	W

APPENDIX G

METEOROLOGICAL DATA

DATE	9-12		9-13		9-14		9-15		9-16		9-17		9-18	
TIME INTERVAL	WS	WS	WS	WD	WS	WD	WS	WD	WS	WD	WS	WD	WS	WD
0000 - 0100	<1	W	3	N	<1	N	<1	N	1	NE	0		1	SE
0100 - 0200	<1	N	4	N	<1	N	<1	N	2	NE	<1	W	2	SE
0200 - 0300	<1	N	4	N	<1	N	<1	N	3	NE	<1	W	2	SE
0300 - 0400	<1	N	5	N	<1	NW	1	N	3	E	1	W	2	SE
0400 - 0500	<1	N	5	N	<1	W	1	N	4	E	<1	W	7	SE
0500 - 0600	<1	N	5	N	<1	SW	2	N	4	E	<1	W	7	SE
0600 - 0700	1	N	4	N	<1	SW	2	N	5	SE	1	W	3	NE
0700 - 0800	3	N	3	N	<1	SW	1	N	5	SE	<1	W	3	E
0800 - 0900	3	N	5	N	<1	S	<1	N	5	S	<1	W	2	E
0900 - 1000	4	N	4	N	<1	W	<1	SE	6	S	<1	W	1	SE
1000 - 1100	4	N	6	N	1	W	<1	SE	7	S	<1	W	4	S
1100 - 1200	4	N	5	N	2	W	3	S	5	S	<1	W	7	S
1200 - 1300	3	N	4	N	2	W	3	S	6	SW	<1	W	8	S
1300 - 1400	6	N	3	N	2	NW	5	S	3	S	<1	W	9	SW
1400 - 1500	4	N	4	N	2	NW	5	S	3	S	<1	W	9	SW
1500 - 1600	5	N	5	N	4	NW	4	SE	3	SW	<1	W	8	SW
1600 - 1700	3	N	6	N	3	N	2	SE	5	SW	<1	W	6	SW
1700 - 1800	6	N	3	NE	2	N	4	SE	2	SW	1	SW	5	SW
1800 - 1900	3	N	3	NE	1	N	7	S	1	SW	<1	SE	3	SW
1900 - 2000	3	N	3	NE	1	N	3	S	2	SW	<1	SE	2	SW
2000 - 2100	5	N	1	N	0		2	E	2	S	1	SE	2	W
2100 - 2200	3	N	1	N	0		2	E	1	SW	4	SE	1	W
2200 - 2300	2	N	1	N	0		1	E	0		4	SE	<1	W
2300 - 0000	3	N	1	N	1	N	1	E	0		3	SE	<1	W

APPENDIX G

METEOROLOGICAL DATA

DATE	9-19		9-20		9-21		9-22		9-23		9-24		9-25	
TIME INTERVAL	WS	WS	WS	WD	WS	WD	WS	WD	WS	WD	WS	WD	WS	WD
0000 - 0100	<1	SW	4	S	1	W	3	S	<1	W	<1	S	2	S
0100 - 0200	<1	W	1	S	1	W	2	SW	<1	W	1	S	2	S
0200 - 0300	<1	W	2	S	1	W	2	SW	<1	W	2	S	3	S
0300 - 0400	<1	W	5	S	1	W	3	SW	<1	W	2	S	4	S
0400 - 0500	0		7	S	1	W	2	SW	<1	W	1	S	4	S
0500 - 0600	0		8	S	<1	W	<1	SW	<1	W	1	S	5	S
0600 - 0700	<1	S	7	S	<1	W	1	SW	<1	W	2	S	3	S
0700 - 0800	<1	S	7	S	1	W	3	SW	<1	W	3	S	2	S
0800 - 0900	0		10	S	1	W	2	SW	<1	W	4	S	2	S
0900 - 1000	2	N	10	S	2	W	2	SW	1	W	4	S	3	S
1000 - 1100	3	N	9	S	2	W	3	W	2	W	6	S	5	S
1100 - 1200	1	SE	9	S	2	W	2	W	1	W	6	S	3	S
1200 - 1300	3	SE	9	S	2	W	3	W	1	W	7	S	3	S
1300 - 1400	3	SE	9	S	2	SW	3	W	2	W	4	S	3	S
1400 - 1500	2	S	7	S	2	SW	3	W	1	W	6	S	3	S
1500 - 1600	<1	E	4	SW	3	SW	3	W	2	W	6	S	3	S
1600 - 1700	<1	NE	2	W	2	W	3	W	1	W	7	S	2	S
1700 - 1800	1	N	1	W	2	W	2	W	1	W	6	S	3	S
1800 - 1900	1	N	2	NW	3	SW	2	W	<1	W	3	S	4	S
1900 - 2000	1	N	1	NW	1	SW	<1	W	<1	W	1	S	1	S
2000 - 2100	<1	NE	<1	W	1	SW	<1	W	<1	SW	1	S	3	SW
2100 - 2200	<1	N	1	W	2	SW	<1	W	<1	SW	2	S	3	SW
2200 - 2300	1	E	2	NW	2	SW	1	W	<1	S	2	S	5	SW
2300 - 0000	2	SE	2	NW	3	SW	<1	W	<1	S	3	S	4	SW

APPENDIX G

METEOROLOGICAL DATA

DATE	9-26		9-27		9-28		9-29		9-30		10-1		10-2	
TIME INTERVAL	WS	WS	WS	WD	WS	WD	WS	WD	WS	WD	WS	WD	WS	WD
0000 - 0100	2	SW	2	SW	<1	S	<1	N	<1	S	<1	N	3	S
0100 - 0200	3	SW	1	SW	<1	N	<1	S	<1	S	1	N	3	SW
0200 - 0300	1	SW	<1	SW	<1	N	<1	S	<1	W	1	N	3	S
0300 - 0400	1	SW	1	S	<1	N	1	S	<1	N	1	N	3	S
0400 - 0500	1	SW	<1	SW	1	N	<1	S	1	N	1	NW	3	S
0500 - 0600	1	SW	<1	SW	1	N	<1	N	1	N	1	N	3	S
0600 - 0700	<1	SW	1	SW	1	N	<1	S	<1	N	1	N	3	S
0700 - 0800	<1	SW	1	S	1	N	<1	N	<1	N	1	N	3	SW
0800 - 0900	2	SW	1	S	1	N	1	SE	<1	N	1	NW	4	S
0900 - 1000	2	SW	2	S	<1	N	1	SE	1	S	<1	NE	5	SW
1000 - 1100	2	SW	3	S	<1	N	2	S	1	N	<1	S	3	S
1100 - 1200	2	SW	2	S	1	N	2	SE	1	N	<1	S	4	SW
1200 - 1300	2	SW	1	S	1	S	2	S	2	E	<1	SW	5	SW
1300 - 1400	2	SW	1	S	3	S	2	S	2	E	<1	S	6	SW
1400 - 1500	3	SW	2	S	3	S	1	S	2	E	2	SE	6	SW
1500 - 1600	3	SW	1	S	3	S	1	SE	1	SE	2	SE	5	SW
1600 - 1700	2	SW	<1	SW	3	S	1	SE	1	N	2	SE	5	SW
1700 - 1800	2	W	<1	SW	2	S	<1	SE	1	NE	2	SE	4	SW
1800 - 1900	2	W	<1	S	<1	N	<1	E	1	N	1	S	3	SW
1900 - 2000	<1	SW	<1	S	<1	N	<1	E	<1	N	1	SE	3	S
2000 - 2100	<1	SW	<1	S	<1	S	<1	SE	<1	N	2	S	4	S
2100 - 2200	<1	SW	<1	SW	<1	N	<1	E	1	N	2	S	4	S
2200 - 2300	<1	SW	<1	SW	<1	N	<1	E	<1	N	3	S	5	S
2300 - 0000	<1	SW	1	SE	<1	N	<1	E	<1	N	3	SW	5	S

APPENDIX G

METEOROLOGICAL DATA

DATE	10-3		10-4		10-5		10-6		10-7		10-8		10-9	
TIME INTERVAL	WS	WD	WS	WD	WS	WD	WS	WD	WS	WD	WS	WD	WS	WD
0000 - 0100	5	S	<1	SW	3	NE	6	SW	1	SSW	1	N	3	NW
0100 - 0200	6	S	<1	SW	3	NE	2	SW	<1	S	<1	NW	4	NW
0200 - 0300	6	S	<1	SW	4	NE	1	W	2	SW	<1	SW	3	NW
0300 - 0400	5	S	1	NW	4	NE	1	S	2	SW	<1	SW	3	NW
0400 - 0500	5	S	1	SE	3	NW	2	SW	2	SSW	<1	S	3	N
0500 - 0600	5	S	1	SE	4	NW	1	SW	2	S	<1	S	4	N
0600 - 0700	5	S	1	SW	4	NW	<1	S	2	S	<1	S	4	NW
0700 - 0800	7	S	1	NW	4	NW	2	SW	3	S	2	NW	3	NW
0800 - 0900	10	SW	1	N	3	NW	2	SW	2	S	2	NW	5	NE
0900 - 1000	9	SW	2	N	2	NW	3	SW	3	S	5	NW	5	N
1000 - 1100	8	SW	1	NW	<1	WNW	3	W	3	S	6	NW	6	N
1100 - 1200	6	SW	4	NE	1	W	3	SW	4	S	5	NW	6	NE
1200 - 1300	5	SW	5	N	1	W	3	SSW	5	S	7	NW	6	NE
1300 - 1400	4	SW	4	N	2	W	4	SW	6	S	8	NW	5	NE
1400 - 1500	6	SW	4	NW	2	W	3	SW	5	S	8	N	4	NE
1500 - 1600	1	SW	3	NW	2	W	3	SW	3	S	8	N	4	NE
1600 - 1700	2	SW	4	NE	2	W	2	SW	4	S	7	N	3	NE
1700 - 1800	<1	SW	4	NE	2	W	3	SW	5	S	5	N	3	NE
1800 - 1900	2	S	3	NE	<1	S	1	SW	7	SW	4	N	2	NE
1900 - 2000	3	S	3	NE	2	SW	1	SSW	7	SW	2	NE	2	NE
2000 - 2100	2	SW	4	NE	4	SW	1	SW	8	SW	1	NW	2	NE
2100 - 2200	1	SW	4	NE	5	SW	1	SW	5	SW	1	NE	1	NE
2200 - 2300	1	SW	3	NE	5	SSW	1	SW	7	SW	3	N	<1	N
2300 - 0000	<1	SW	4	NE	6	SSW	2	SW	4	SW	3	NW	<1	N

APPENDIX G

METEOROLOGICAL DATA

DATE	10-10		10-11		10-12		10-13		10-14		10-15		10-16	
TIME INTERVAL	WS	WD	WS	WD	WS	WD	WS	WD	WS	WD	WS	WD	WS	WD
0000 - 0100	<1	N	1	SE	6	SE	<1	W	5	SW	<1	SW	2	NE
0100 - 0200	1	N	1	SE	5	SE	<1	W	7	SW	2	S	2	E
0200 - 0300	1	N	1	SE	6	SE	<1	W	5	SW	1	SW	<1	E
0300 - 0400	1	N	<1	E	6	SE	<1	W	6	SSW	<1	SW	<1	NE
0400 - 0500	1	N	<1	E	5	SE	<1	W	8	SW	<1	S	<1	NE
0500 - 0600	<1	NE	1	E	5	SE	<1	W	7	SW	<1	S	<1	E
0600 - 0700	<1	N	1	SE	6	SE	<1	NW	5	SW	<1	NW	2	SE
0700 - 0800	1	NE	2	SE	4	SE	1	NW	5	SW	<1	SW	2	SE
0800 - 0900	1	E	2	SE	5	SE	<1	W	6	SW	<1	S	3	SE
0900 - 1000	2	E	5	SE	4	SE	<1	W	7	SW	<1	S	3	SE
1000 - 1100	3	ESE	5	S	5	SE	<1	W	10	SW	<1	S	3	SE
1100 - 1200	2	SE	4	SE	5	SE	1	W	10	SW	<1	S	4	SE
1200 - 1300	2	SE	6	SE	6	SE	1	W	10	SW	1	NE	4	SE
1300 - 1400	2	SE	5	SE	8	SE	1	W	10	SW	2	NE	3	S
1400 - 1500	2	E	5	SE	6	SE	2	NW	7	SW	3	SE	5	S
1500 - 1600	3	SE	6	SE	5	SE	1	W	4	SW	2	SE	6	S
1600 - 1700	3	SE	7	SE	6	SE	2	SW	5	SW	3	SE	5	S
1700 - 1800	3	SE	6	SE	5	SE	2	SW	4	SW	2	E	6	S
1800 - 1900	2	SE	5	SE	6	S	3	SW	3	SW	2	E	6	S
1900 - 2000	2	NE	5	SE	3	SW	2	SW	3	SW	2	E	5	S
2000 - 2100	<1	NE	5	SE	2	S	<1	SW	2	S	2	E	4	S
2100 - 2200	1	E	5	SE	2	S	1	SW	2	SW	2	NE	3	S
2200 - 2300	1	SE	6	SE	2	SW	2	SW	1	SW	2	NE	3	SW
2300 - 0000	1	E	6	SE	1	W	2	SW	1	S	1	NE	3	S

APPENDIX G

METEOROLOGICAL DATA

DATE	10-17		10-18		10-19		10-20		10-21		10-22		10-23	
TIME INTERVAL	WS	WD	WS	WD	WS	WD	WS	WD	WS	WD	WS	WD	WS	WD
0000 - 0100	3	S	<1	SW	1	N	2	NE	4	NE	3	NE	1	NE
0100 - 0200	2	SW	1	W	2	N	3	NE	3	NE	3	NE	2	NE
0200 - 0300	1	W	1	NW	2	N	4	NE	2	NE	2	NE	2	NE
0300 - 0400	1	W	1	SW	3	N	3	NE	2	NE	2	NE	2	NE
0400 - 0500	<1	SW	1	SW	2	N	2	NE	2	NE	2	NE	2	NE
0500 - 0600	1	SW	1	SW	3	N	2	NE	2	NE	3	NE	2	NE
0600 - 0700	1	SW	1	S	3	NE	2	NE	2	NE	1	NE	2	NE
0700 - 0800	1	SW	1	S	3	NE	2	N	2	NE	1	NE	3	NE
0800 - 0900	1	SW	1	S	2	N	2	N	2	NE	2	NE	3	N
0900 - 1000	<1	S	<1	S	2	NW	2	N	2	NE	3	NE	3	NE
1000 - 1100	<1	S	<1	S	2	NE	2	N	2	NE	3	NE	4	N
1100 - 1200	<1	S	<1	S	2	NE	3	NE	2	NE	3	NE	4	N
1200 - 1300	1	SW	<1	S	3	NE	4	NE	2	NE	4	NE	4	N
1300 - 1400	1	SW	<1	S	3	NE	4	NE	3	NE	2	NE	5	N
1400 - 1500	1	NW	<1	S	3	NE	4	NE	3	NE	3	NE	6	N
1500 - 1600	2	NW	<1	S	3	NE	5	NE	4	NE	3	NE	6	N
1600 - 1700	1	W	<1	NE	3	NE	5	NE	5	NE	3	NE	5	N
1700 - 1800	1	W	1	NW	3	NE	6	NE	4	E	2	NE	6	N
1800 - 1900	1	W	1	NE	3	NE	6	NE	5	NE	2	NE	6	N
1900 - 2000	1	SW	<1	SE	3	NE	6	NE	4	E	2	NE	6	NE
2000 - 2100	<1	W	1	SE	2	NE	7	NE	3	NE	2	NE	6	NE
2100 - 2200	<1	SW	1	SE	3	NE	7	NE	2	NE	1	NE	7	N
2200 - 2300	<1	SW	1	SE	2	NE	5	NE	2	N	1	NE	6	N
2300 - 0000	<1	SW	1	S	2	NE	4	NE	3	NE	2	NE	7	NE

APPENDIX G

METEOROLOGICAL DATA

DATE	10-24		10-25		10-26		10-27		10-28		10-29		10-30	
TIME INTERVAL	WS	WD	WS	WD	WS	WD	WS	WD	WS	WD	WS	WD	WS	WD
0000 - 0100	7	N	<1	NW	<1	SW	<1	NW	10	SW	1	NW	<1	N
0100 - 0200	7	NE	<1	NW	<1	SW	<1	NW	7	SW	1	NW	<1	NE
0200 - 0300	7	N	<1	NW	<1	SW	<1	SW	9	SW	<1	NW	<1	NE
0300 - 0400	6	N	<1	NW	1	SW	<1	SE	8	SW	<1	NW	<1	NNE
0400 - 0500	6	NE	<1	W	1	S	<1	S	9	SW	<1	NW	<1	NE
0500 - 0600	5	NE	<1	W	1	SW	<1	S	8	SW	<1	NW	<1	N
0600 - 0700	5	N	<1	W	1	S	<1	S	7	SW	<1	NW	<1	SE
0700 - 0800	6	N	<1	W	1	W	<1	S	6	SW	<1	NW	<1	NE
0800 - 0900	5	N	<1	SW	1	SW	1	S	6	SW	<1	NW	<1	NE
0900 - 1000	5	N	2	W	1	SW	2	SW	6	SW	3	NW	1	SE
1000 - 1100	5	N	1	SW	<1	SW	4	S	8	SW	5	NW	2	S
1100 - 1200	4	NE	2	W	1	NW	5	S	8	SW	6	NW	2	S
1200 - 1300	5	N	3	W	2	NW	7	S	10	SW	5	NW	2	S
1300 - 1400	6	N	3	NW	2	NW	8	SW	9	SW	4	NW	2	S
1400 - 1500	4	N	3	W	4	NW	7	SSW	8	SW	2	NW	2	S
1500 - 1600	3	NE	3	W	7	NW	9	SW	6	W	2	NW	1	S
1600 - 1700	1	NE	2	NW	6	NW	7	S	5	NW	1	NW	1	S
1700 - 1800	2	NE	2	NW	3	NW	8	S	6	NW	<1	NW	1	S
1800 - 1900	2	NE	1	NW	1	NW	6	S	5	NW	<1	N	1	SE
1900 - 2000	1	NE	<1	W	2	NW	6	S	4	NW	<1	NE	<1	S
2000 - 2100	1	NE	<1	W	1	NW	7	S	3	NW	<1	NE	<1	S
2100 - 2200	<1	NE	<1	SW	<1	NW	10	SW	2	NW	<1	NE	<1	SW
2200 - 2300	1	NE	<1	SW	<1	NW	10	S	2	NW	<1	NNE	<1	SE
2300 - 0000	<1	N	<1	SW	<1	NW	11	SW	1	NW	<1	N	<1	S

APPENDIX G

METEOROLOGICAL DATA

DATE	10-31		11-1		11-2		11-3		11-4		11-5		11-6	
TIME INTERVAL	WS	WD	WS	WD	WS	WD	WS	WD	WS	WD	WS	WD	WS	WD
0000 - 0100	<1	SW	<1	NE	3	S	5	NW	8	NW	5	NW	<1	S
0100 - 0200	<1	SW	<1	NE	2	S	5	NW	7	NW	4	NW	<1	S
0200 - 0300	<1	S	<1	NE	2	S	3	NW	7	NW	3	NW	<1	S
0300 - 0400	<1	SW	<1	NE	3	S	5	NW	5	NW	2	NW	1	SW
0400 - 0500	<1	SW	<1	NE	3	S	6	NW	5	NW	2	NW	2	SW
0500 - 0600	<1	SW	<1	N	4	S	10	N	5	NW	2	NW	2	S
0600 - 0700	<1	SW	<1	N	4	S	10	N	3	NW	2	NW	3	S
0700 - 0800	<1	SW	<1	N	5	S	10	NW	4	NW	2	NW	4	S
0800 - 0900	<1	SW	<1	N	4	S	10	N	4	NW	4	NW	4	S
0900 - 1000	<1	NE	3	S	5	S	10	N	7	NW	6	NW	4	SW
1000 - 1100	1	SE	3	S	5	S	10	NW	7	NW	4	N	3	S
1100 - 1200	1	E	2	S	4	S	12	N	8	NW	3	N	5	SW
1200 - 1300	1	SE	4	S	4	S	10	N	9	NW	2	NW	4	SW
1300 - 1400	2	SE	5	S	4	SW	10	N	10	NW	2	NW	3	SW
1400 - 1500	2	SE	5	S	1	SW	10	N	9	NW	2	NW	2	W
1500 - 1600	2	SE	2	S	1	SW	8	N	10	NW	2	NW	<1	W
1600 - 1700	1	SE	1	S	<1	W	5	N	6	NW	1	S	<1	W
1700 - 1800	<1	E	2	S	<1	W	3	N	4	NW	<1	S	<1	W
1800 - 1900	<1	NE	<1	S	<1	SW	5	NW	6	NW	<1	S	<1	W
1900 - 2000	<1	E	1	SE	<1	W	3	NW	6	NW	1	S	<1	W
2000 - 2100	<1	NE	1	S	<1	W	3	NW	4	NW	<1	S	<1	W
2100 - 2200	<1	NE	1	S	1	NW	4	NW	4	NW	<1	S	<1	NW
2200 - 2300	<1	E	1	S	4	NW	3	NW	5	NW	<1	S	<1	NW
2300 - 0000	<1	NE	3	S	5	NW	8	NW	5	NW	<1	S	<1	NW

APPENDIX G

METEOROLOGICAL DATA

DATE	11-7		11-8		11-9		11-10		11-11		11-12		11-13	
TIME INTERVAL	WS	WD	WS	WD	WS	WD	WS	WD	WS	WD	WS	WD	WS	WD
0000 - 0100	<1	N	5	S	1	S	3	SE	12	N	5	NW	<1	W
0100 - 0200	<1	N	5	S	2	S	2	SE	12	N	6	NW	1	N
0200 - 0300	1	N	5	S	1	S	2	SE	13	N	5	NW	1	N
0300 - 0400	<1	NW	5	S	1	S	1	SE	12	NW	4	NW	1	N
0400 - 0500	<1	N	5	S	1	SE	<1	SE	10	NW	4	NW	1	N
0500 - 0600	<1	W	5	S	2	NE	<1	N	10	NW	3	NW	1	N
0600 - 0700	<1	SW	5	S	2	NE	1	NE	10	NW	3	NW	1	N
0700 - 0800	1	NW	5	S	1	NE	3	N	8	NW	2	NW	<1	N
0800 - 0900	1	N	5	S	1	NE	2	N	10	NW	3	NW	<1	SE
0900 - 1000	2	NE	7	S	2	E	3	N	11	NW	5	NW	1	SE
1000 - 1100	3	SE	5	S	1	SE	5	N	12	NW	6	NW	2	S
1100 - 1200	2	S	4	SW	1	SE	6	N	11	NW	4	NW	2	S
1200 - 1300	2	S	5	SW	1	SE	9	N	12	NW	4	NW	3	S
1300 - 1400	2	S	7	SW	2	E	9	N	12	NW	3	NW	3	S
1400 - 1500	2	SE	6	SW	1	NE	10	N	11	NW	3	NW	3	S
1500 - 1600	1	SE	6	SW	2	SE	10	N	10	NW	2	NW	3	S
1600 - 1700	<1	SE	5	SW	2	SE	10	N	11	NW	1	NW	3	SE
1700 - 1800	1	SE	4	SW	1	E	11	N	7	NW	<1	W	2	SE
1800 - 1900	2	SE	1	S	1	NE	10	N	8	NW	<1	S	2	SE
1900 - 2000	2	S	1	S	1	NE	12	N	9	NW	<1	S	2	SE
2000 - 2100	3	S	<1	S	3	E	12	N	10	NW	<1	S	2	SE
2100 - 2200	3	S	<1	N	6	SE	12	N	10	NW	1	NW	3	SE
2200 - 2300	4	S	<1	N	5	SE	12	N	8	NW	1	N	3	SE
2300 - 0000	3	S	<1	SE	4	SE	12	N	6	NW	1	N	3	S

APPENDIX G

METEOROLOGICAL DATA

DATE	11-14		11-15		11-16	
TIME INTERVAL	WS	WD	WS	WD	WS	WD
0000 - 0100	3	S	2	NE	7	NW
0100 - 0200	2	S	2	NE	7	NW
0200 - 0300	2	S	2	NE	7	NW
0300 - 0400	2	S	3	NE	6	NW
0400 - 0500	3	S	2		6	NW
0500 - 0600	2	S	3	N	6	NW
0600 - 0700	3	S	3	N	6	NW
0700 - 0800	2	S	3	N	6	NW
0800 - 0900	2	S	3	N		
0900 - 1000	3	SE	3	N		
1000 - 1100	3	SE	5			
1100 - 1200	5	SE	6	N		
1200 - 1300	6	SE	6	N		
1300 - 1400	7	SE	6	N		
1400 - 1500	5	SE	6	N		
1500 - 1600	3	E	5	N		
1600 - 1700	3	E	6	N		
1700 - 1800	3	E	8	N		
1800 - 1900	3	E	10	N		
1900 - 2000	2	E	10	N		
2000 - 2100	1	NE	11	N		
2100 - 2200	1	E	12	N		
2200 - 2300	1	NE	12	N		
2300 - 0000	2	NE	9	NW		

NOTES:

WS = Wind Speed (m.p.h.)
WD = Wind Direction
N = North
W = West
S = South
E = East