

# **1999 Auburn NC Tower Multi-Elevation Ozone and Volatile Organic Compound Monitoring Project Report**

**Ambient Monitoring Section**

**Division of Air Quality**

**Department of Environment and Natural Resources**

**Report No. 2000.02**

**November 2000**



## **Abstract**

The 1999 Multi-Elevation Ozone and Volatile Organic Compound Monitoring Project at the Auburn-TV Tower was conducted at 8 feet (ground), 250 feet, 420 feet, 820 feet and 1420 feet elevations. Ozone was monitored continuously at the 8 feet, 250 feet, 420 feet, and 1420 feet levels from April through October. Morning and afternoon integrated 3-hour volatile organic compound samples were collected in polished stainless steel canisters at the 8 feet, 820 feet, and 1420 feet levels for analysis of PAMS hydrocarbons.

## **Keywords**

Ozone, Multi-elevation Ozone Monitoring, Diurnal Ozone Patterns, PAMS, Hydrocarbons

## **Authors**

Charles O. Davis III and Thomas L. Manuszak

## **Previous Reports: 1993-1998 and Related Studies**

The 1993 - 1998 reports published by the Division of Air Quality outlined the data collected, monitoring methods and boxplots of daily ozone concentrations at three levels. The previous reports are available upon request.

If you have any questions concerning this report please contact  
Charles Davis at 919-715-0664.

## Contents

<b>1.</b>	<b>Introduction</b> .....	1
	Ozone and Volatile Organic Compound Monitoring Study .....	1
<b>2.</b>	<b>Study Site</b> .....	2
<b>3.</b>	<b>Ozone Monitoring</b> .....	3
	3.1 Ozone Monitoring Method .....	4
	3.2 Ozone Monitor Adjusted Calibrations and Autocalibrations .....	5
	3.3 Unadjusted Calibrations and Site Operator Inspections .....	5
	3.4 Ozone Data Collection Period .....	6
	3.5 Ozone Monitor Accuracy Audits .....	6
<b>4.</b>	<b>Volatile Organic Compound Sampling and Analysis</b> .....	8
	4.1 Volatile Organic Compound Analytical Procedure .....	9
	4.2 Volatile Organic Compound Calibration .....	10
	4.3 Volatile Organic Compound Sampling Period .....	10
<b>5.</b>	<b>Ozone and VOC Monitoring Results</b> .....	12
	5.1 Ozone Monitoring Results .....	12
	5.2 Volatile Organic Compound Monitoring Results .....	16
<b>6.</b>	<b>Requests For Electronic Copies Of The Data</b> .....	24
<b>Appendix A.</b>	Hourly Average Ozone Data .....	A-1 - A-22
<b>Appendix B.</b>	Volatile Organic Compound Data .....	B-1 - B-13

## List of Tables

Table 1	North Carolina Ozone Accuracy Audit	7
Table 2	1999 NPAP Audit Results	7
Table 3	Target Volatile Organic Compounds	10
Table 4	Hydrocarbon Sampling Days	11
Table 5	Monthly Average and Maximum Ozone Concentrations (ppm) All Levels	12
Table 6	Ozone Exceedances ( $\geq 0.084$ ppm) and Upper Level 8-hr Averages	13
Table 7	24-Hour Average Ozone Concentrations Greater than $> 0.084$ ppm	14
Table 8	Total VOC, NMOC, and Unknown - Minimum, Maximum, and Median Conc.	16
Table 9	Paraffin, Olefin, and Aromatic Distribution of Identified Compounds.	17
Table 10	Most Frequently Detected Compounds	18
Table 11	Median Target Compound Concentration (ppbC)	19

## List of Figures

Figure 1	Auburn Tower Location in Wake County, North Carolina	2
Figure 2	Ozone Monitoring, Calibration, and Data Collection System Configuration	3
Figure 3	Ozone Calibration and Monitoring Schematic	4
Figure 4	Hydrocarbon Sampling System	8
Figure 5	Tower Ground Level Ozone Diurnal Cycle	15
Figure 6	Diurnal Isoprene Pattern	18
Figure 7	Change in Ground Level Target VOC Concentrations Morning to Afternoon	20
Figure 8	Change in 820 Feet Level Target VOC Concentrations Morning to Afternoon	21
Figure 9	Change in 1420 Feet Level Target VOC Concentrations Morning to Afternoon	21
Figure 10	Comparison of Morning Target VOC Concentrations	22
Figure 11	Comparison of Afternoon Target VOC Concentrations	23



## **Acknowledgments**

We thank Wade Daniel, Frank Stellitano, Kip Davenport, and Hoke Kimball for their technical contribution and assistance. We also thank George C. Murray Jr. for his managerial guidance; the Electronics and Calibration Branch (ECB) staff for performing the operational audits and maintaining the monitoring equipment; Wayne Cornelius, Ph.D. Tahmina Islam, and Victoria Georgiou for data processing assistance; and Phyllis Lowry for hydrocarbon sample analysis.

## **1. Introduction**

The Ambient Monitoring Section is responsible for evaluating the ambient air quality of the State of North Carolina for the Division of Air Quality (DAQ) of the Department of Environment and Natural Resources. The Ambient Monitoring Section supports this evaluation through its operation of criteria pollutant (O<sub>3</sub>, CO, SO<sub>2</sub>, PM<sub>2.5</sub>, NO<sub>2</sub>, Pb) monitoring stations and special purpose (HAPS metals, NO<sub>y</sub>, hydrocarbons) monitoring stations throughout the state. Ground level ozone and its associated health effects continue to be a primary concern of DAQ. In 1999, there were forty-five (45) ground level ozone monitoring sites in operation in North Carolina. Thirty-three (33) of these ozone monitoring sites were operated by the Ambient Monitoring Section with the remaining sites operated by four other agencies. These agencies are the Eastern Band of the Cherokee Indians (1 site), Forsyth County Environmental Affairs Department (4 sites), and Mecklenburg County Department of Environmental Protection (3 sites), and Western NC Regional Air Pollution Control Agency (4 sites). The Auburn-TV Tower (designated "Tower" in this report) is a Special Purpose Monitoring site (SPM) and is the only multi-elevation monitoring site in North Carolina. This report describes the ozone monitoring equipment, the operation and calibration procedures employed, the hydrocarbon sampling equipment, the hydrocarbon analytical procedures, and the data collected during the 1999 ozone season. In 1999, meteorological measurements of wind speed, wind direction, and temperature were planned, but due to operational difficulties (radio frequency interference) these parameters were not determined. Efforts are continuing to collect multi-level meteorological data at the tower.

### **Ozone and Volatile Organic Compound Monitoring Study**

The Ozone Season in North Carolina is from April 1 to October 31. In 1997, the National Ambient Air Quality Standard (NAAQS) for ozone was established at >0.08 parts per million (ppm) 8-hr average. In 1999, there were 541 verified exceedances of this new ozone standard in North Carolina. The ozone level at one or more of the six monitoring sites in the immediate Raleigh area exceeded the new 8-hour ozone standard 29 days between May 28 and August 28 for a total of 84 exceedances. On two days during the season, all monitors in the immediate Raleigh area reported 8-hour averages exceeding the ozone standard. The ground level tower monitor reported ozone concentrations exceeding this new standard on 22 days. The upper level monitors at the tower (which do not conform to the siting criteria established for NAAQS) reported 78 8-hour average ozone levels greater than the standard over 30 different days between May 28 and August 28.

Morning and afternoon 3-hour integrated PAMS hydrocarbon samples were collected in Summa™ Canisters approximately once a week starting May 31 through September 8 at three levels for a total of 14 hydrocarbon sample sets. These samples were collected and analyzed in accordance with the Photochemical Assessment Monitoring Station procedures for 56, C<sub>2</sub> - C<sub>12</sub>, hydrocarbon compounds. One of these compounds is biogenic, namely isoprene, and the other 55 compounds are directly related to man's activities.

## 2. Study Site

The Tower site is a Special Purpose Monitoring (SPM) site established in May 1993 by the DAQ. The site is located approximately 20 kilometers southeast of Raleigh, NC, at 35.68.33 Latitude and -78.55.00 Longitude, approximately 300 meters southwest of US-70 a Type 2 Road (Expressway), and is 97.5 meters Elevation Above Sea level (Figure 1). It has a "suburban" Location Setting with "agricultural" Land Use. US-70 usage is 42,000 vehicles per day. The television and radio broadcasting tower at this site is 2,000 feet tall and was put into service in October 1990 as a replacement for the previous tower that collapsed in December 1989. In 1993 - 1995, the ozone determinations were performed at ground level, 820 feet level and 1420 feet level. In 1996, the ozone monitoring levels were changed to ground level, 250, 420, and 1420 feet elevations and were continued to be used in 1997, 1998, and 1999. These levels were selected because of the presence of platforms. The platforms provide work space for the convenient installation of particulate (ozone pretreated) filters on the intake side of the Teflon FEP® ozone sampling lines. The filters prevent particulate matter from depositing on the inside of the sampling tubing. The upper levels of the tower are accessed by a two-person elevator in the center of the Tower.

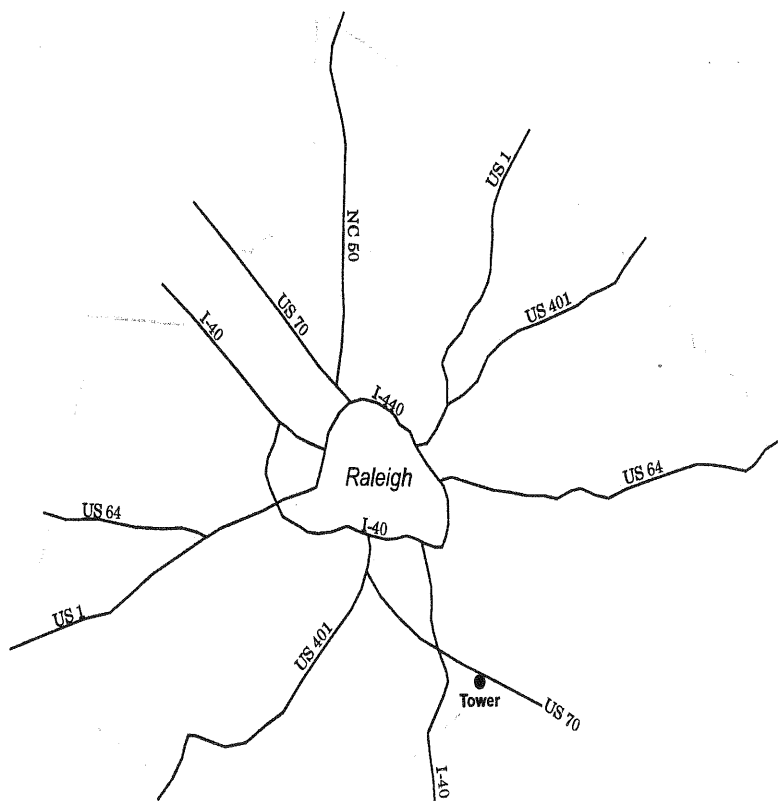


Figure 1. Auburn Tower Location in Wake County, North Carolina

### 3. Ozone Monitoring

The ozone sample assembly at each elevated level includes a 90 mm Teflon® filter holder with a 5  $\mu\text{m}$  Teflon® particulate filter. The probes are located on the southwest part of the tower for unobstructive exposure to the predominant southwesterly summer winds. Each probe arm, made of stainless steel tubing, extends approximately 2 meters away from the tower platform with a 60 degree downward bend on the arm to minimize precipitation entering the probe line. To further minimize the moisture/precipitation problem, the FEP lines stop two feet inside the end of the stainless steel probe arm. The ends of the probe are covered with stainless steel screens. Before sampling begins on the tower, the long sample lines are inspected for water and obvious breaks and repairs are performed. Each line was then disconnected at the 90 mm filter, capped off and pressure tested to check for leaks in the long sample lines. No leaks were detected and the lines were reattached to the filters and readied for sampling. The 90 mm particulate filter at each sampling platform was replaced with a new ozone conditioned filter and filter assembly which was replaced monthly thereafter. Figure 2 presents the configuration of the monitoring system at this special

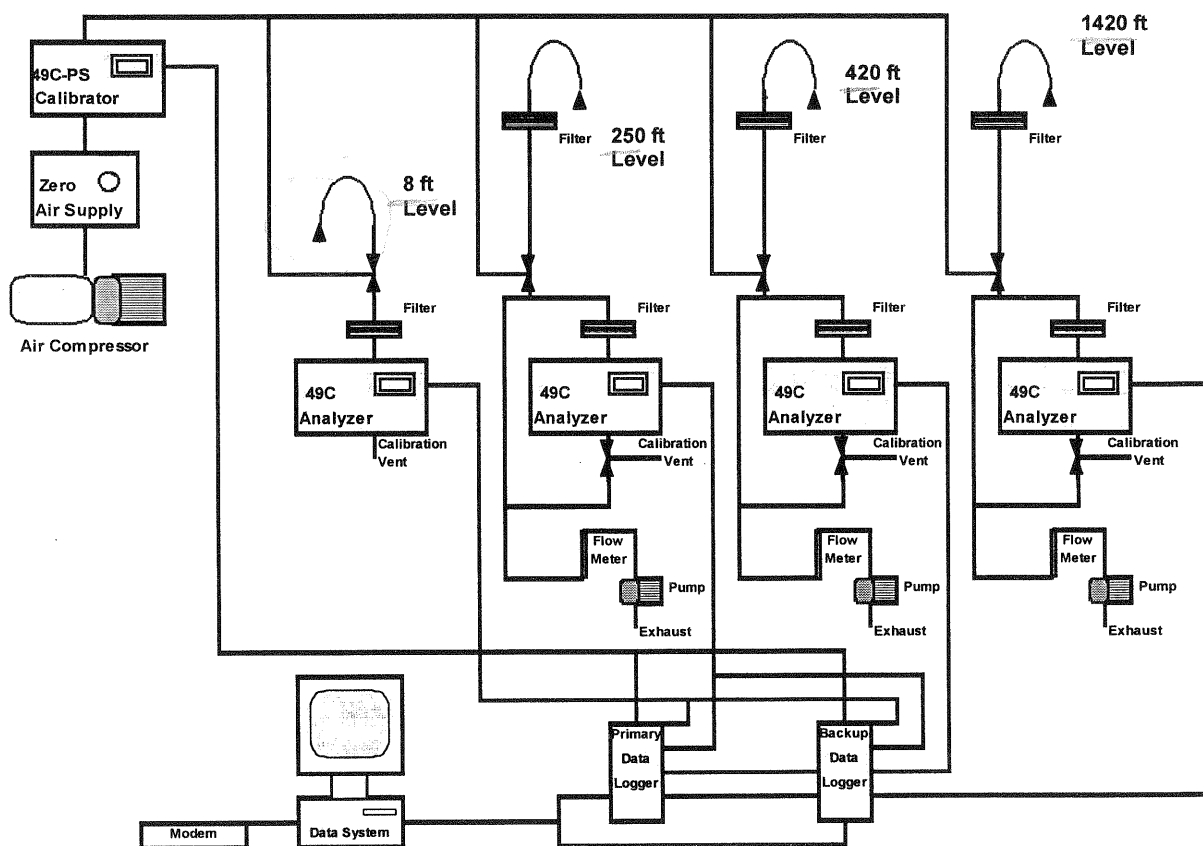


Figure 2. Ozone Monitoring, Calibration, and Data Collection System Configuration

site. All of the ozone monitoring systems are housed in a 12' x 8' temperature controlled building located adjacent to the base of the tower. The upper level ozone sampling lines are attached to the superstructure of the tower connecting each level directly to a dedicated 10 liter per minute sampling pump to reduce the sample residence time in the sampling lines. Each level has a dedicated ozone analyzer. The ozone analyzer, calibrator, zero air supply, air compressor, and the data collection system are also located in this building. Each of the upper levels Teflon sampling lines was leak tested prior to the ozone monitoring season.

### 3.1 Ozone Monitoring Methods

Ozone was measured using the ultraviolet photometric principle. In 1998, the monitors and calibrators for the entire state-operated ozone monitoring network in North Carolina were replaced with Thermo Environmental Inc. Model 49C Ozone Analyzers and Model 49C-PS Ozone Calibrators. The TEI Model 49C is designated by the USEPA as an Equivalent Method for the measurement of ambient concentrations of ozone pursuant with the requirements defined in the Code of Federal Regulations, Designated Equivalent Method Number, EQOA-0880-047. A single TEI Model 49C-PS calibrator traceable to the NC Primary Ozone Standard Photometer was used to perform all calibrations and precision checks for the four ozone monitors. This same calibrator was used to perform nightly autocalibrations of each of the analyzers. The outputs of the monitors were connected to a data logger and to a "back-up" data system. The Figure 3 is a schematic of the sampling and calibration pathways for each ozone analyzer.

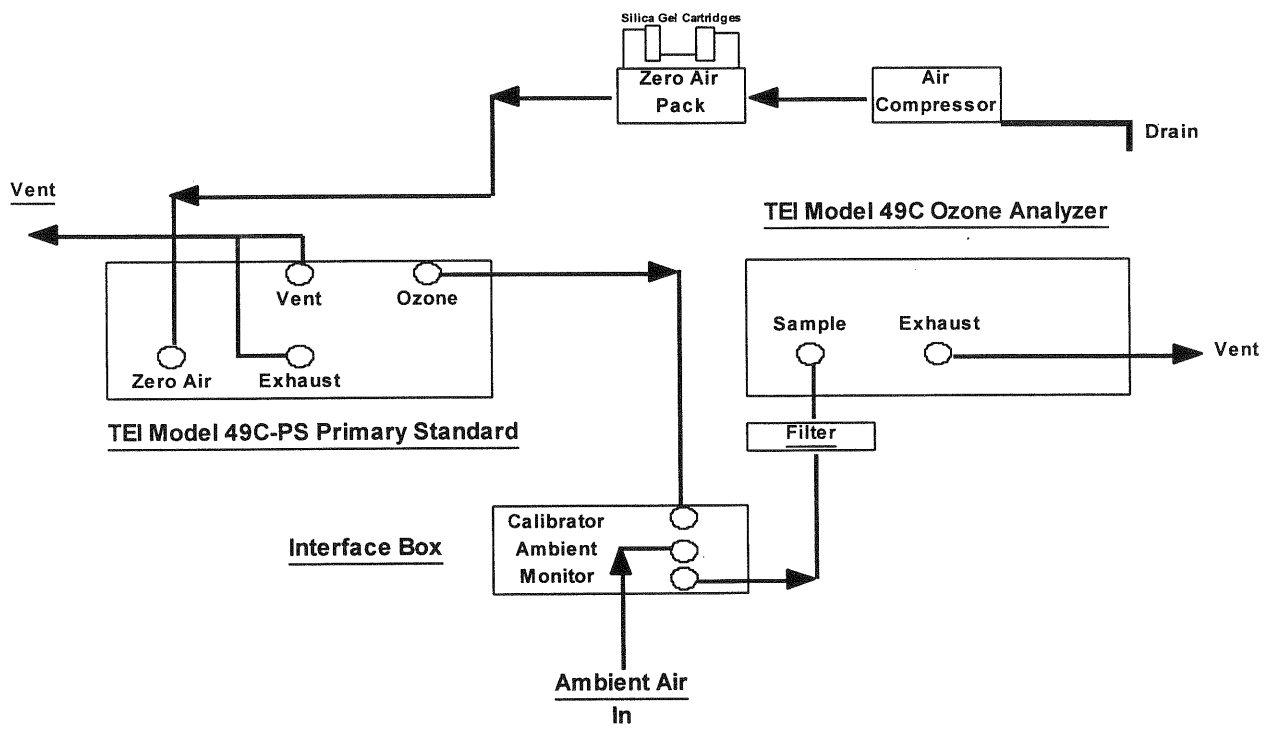


Figure 3. Ozone Calibration and Monitoring Schematic.

### 3.2 Ozone Monitor Adjusted Calibration and Nightly Autocalibrations

The TEI Model 49C Ozone Analyzers are operated on the 0.000 to 0.250 parts per million range. Prior to the beginning of the ozone monitoring season, an Adjusted Calibration is performed on each of the four ozone analyzers per Section 2.7 "Ozone Monitoring Using the Thermo Environmental Continuous Monitor and Data Logger" of the North Carolina Standard Operating Procedures and Quality Assurance Plan Section 2.7 as approved by the EPA. This calibration adjusts the ozone analyzer to read exactly the same as the on-site Ozone Primary Standard Calibrator, which is traceable to the North Carolina Primary Ozone Standard Photometer, which has been verified by the EPA Region 4 Reference Photometer. The ozone analyzer is calibrated at 0.000, 0.050, 0.090, 0.160, and 0.225 ppm ozone. The acceptance criteria for an adjusted calibration are as follows:

<u>Primary Standard</u>	<u>Ozone Analyzer</u>
0.000 ppm	0.000 ppm $\pm$ 0.003 ppm
0.050 ppm	0.050 ppm $\pm$ 0.003 ppm
0.090 ppm	0.090 ppm $\pm$ 0.003 ppm
0.160 ppm	0.160 ppm $\pm$ 0.003 ppm
0.225 ppm	0.225 ppm $\pm$ 0.003 ppm

Each night throughout the monitoring season, an unadjusted autocalibration is performed on each of the analyzers at 0.000, 0.050, 0.090, and 0.225 ppm ozone generated by the on-site Primary standard calibrator and recorded by the data collection system. Each autocalibration requires approximately 45 minutes to complete per analyzer. The nightly autocalibrations of the four ozone analyzers at this site occur between 3 am. and 7 am.

### 3.3 Unadjusted Calibrations and Site Operator Inspections

In accordance with Section 2.7 of QA/SOP the site operator performs a thorough site inspection, equipment evaluation, a full manual Unadjusted Calibration and Precision Check of each ozone analyzer, and backs up the data system on at least a biweekly basis. These site visits are to verify and document instrument operating parameters and performance and archive collected data. These site inspections and unadjusted calibrations are performed before 11 am due to the diurnal pattern of the formation of ground level ozone. During these visits the operator replaces and conditions the 5 $\mu$ m particulate filter (located at the back of each instrument), replaces silica gel cartridges on the zero air pack, and performs a "data backup" of all the data collected since the previous site visit. The operator records his activities in the Site Logbook and documents the site evaluation and unadjusted calibration results in the Ozone Monitoring Logbook.

The site operator determines the ozone analyzer performance while challenging the monitor with 0.000, 0.050, 0.090, 0.160, and 0.225 ppm ozone generated by the

onsite ozone primary standard. The following criteria have been established to evaluate analyzer performance:

<u>Site Primary Standard</u>	<u>Ozone Analyzer</u>
0.000 ppm	0.000 ppm $\pm$ 0.003 ppm
0.050 ppm	0.050 ppm $\pm$ 0.003 ppm
0.090 ppm	0.090 ppm $\pm$ 0.003 ppm
0.160 ppm	0.160 ppm $\pm$ 0.005 ppm
0.225 ppm	0.225 ppm $\pm$ 0.010 ppm

If the analyzer does not meet these performance criteria, the site operator first troubleshoots the analytical system and then performs an adjusted calibration.

### 3.4 Ozone Data Collection Period.

Ozone monitoring at the ground level of the Tower began on April 1 and continued through October 31, 1999. Monitoring at the upper levels began on May 14. The 1999 ozone monitoring periods for all levels at the Auburn Tower Site are listed below:

<u>Level</u>	<u>Start</u>	<u>End</u>
Ground Level	April 1, 1999 at 0000 hr	Oct. 31, 1999 2300 hr
250 Feet Level	May 14, 1999 at 1000 hr	Sept. 14, 1999 1800 hr
420 Feet Level	May 14, 1998 at 1300 hr	Sept. 14, 1999 1800 hr
1420 Feet Level	May 14, 1998 at 1300 hr	Sept. 14, 1999 1800 hr

Ozone monitoring was performed at the Ground Level until the end of the ozone monitoring season (October 31, 1999). On September 14, 1999, the Tower ozone monitoring site was shut down in anticipation of Hurricane Floyd to protect the equipment. The Ground level monitor was reactivated on September 21 but the upper levels were not restarted. The data completeness for 1999 exceeds 90% at all levels.

### 3.5 Ozone Monitor Accuracy Audits

Accuracy audits are performed to evaluate and document the performance of the site monitoring system. The State of North Carolina DAQ Ambient Monitoring Section independently conducts accuracy audits of all ozone monitoring sites operated by the state and also participates in the National Performance Audit Program (NPAP) conducted by the USEPA. Each ozone monitoring site operated by NC participates in the NPAP audit.

The NC Accuracy Audit was performed on June 18, 1999, for the surface, 250, 420, and 1420 feet levels. The audit was performed by the Electronics and Calibration Branch (ECB) using a separate Thermo Environmental Model 49C-PS Primary Standard traceable to the NC Primary Ozone Standard Photometer. The audit device is taken to the site and is plumbed directly to the ozone analyzer to be audited. After

the analyzer and audit device have stabilized, the actual concentration generated by the audit device is compared to the analyzer's data logger response to this known concentration. The procedure is used for each audit point (0.000, 0.050 ppm, 0.090, 0.160, 0.225 ppm). The percent difference for each point is calculated as follows:

$$d_2 = \frac{(C_M - C_A) \times 100}{C_A}$$

Where:

$C_M$  = average ozone concentration measured

$C_A$  = average true concentration of audit gas produced by the audit calibrator.

The results of the NC Accuracy audit for each monitor are presented in Table 1.

Table 1. North Carolina Ozone Accuracy Audit

Ground Level			250 Ft Level			420 Ft Level			1420 Ft Level		
Audit Actual	Monitor Indicated	% Diff	Audit Actual	Monitor Indicated	% Diff	Audit Actual	Monitor Indicated	% Diff	Audit Actual	Monitor Indicated	% Diff
0.001	0.001	NA	0.001	0.001	NA	-0.001	0.000	NA	0.002	0.001	NA
0.050	0.049	2.0	0.050	0.049	-2.0	0.049	0.048	-4.0	0.050	-0.049	-2.0
0.090	0.091	1.1	0.090	0.090	0.0	0.089	0.089	-1.1	0.090	0.091	1.1
0.160	0.162	1.3	0.160	0.162	1.3	0.159	0.160	0.0	0.160	0.165	3.1
0.225	0.228	1.3	0.225	0.228	1.3	0.187	0.226	0.4	0.225	0.232	3.1
	Avg	1.4		Avg	1.2		Avg	1.4		Avg	2.3

The data from ground level ozone analyzer at this special purpose monitoring site is reported to the EPA and therefore was included in the 1999 National Performance Audit Program (NPAP) audit. The results in parts per billion ozone of that audit performed on May 20, 1999 are presented in Table 2:

Table 2. 1999 NPAP Accuracy Audit Results

Date	NPAP Audit Results					NPAP			% Diff		
	Temp	BP	Zero	Low	High	Actual Value			Low	High	Mean
4/28	24	766	-1	78	173	0.3	74	167.8	5.4	3.1	4.25



#### 4. Volatile Organic Compound Sampling and Analysis

Hydrocarbons are an important component of the ozone production cycle and a better understanding of the speciation and dispersal in the atmosphere is needed to better understand the complex ozone atmospheric chemistry. The Tower site provides an unique opportunity to collect ambient hydrocarbon samples simultaneously at ground level, 820 feet, and 1420 feet. Samples were collected at 6 - 9 am. and from 2 - 5 pm at all levels.

A schematic of the hydrocarbon sampling system is shown in Figure 4. The ground level hydrocarbon sampling system is housed within the same building adjacent to the tower as the ozone monitoring systems. The hydrocarbon collection systems on the upper levels (820 feet and 1420 feet) are housed in specially constructed weather proof enclosures. These two upper levels were chosen because of the availability of electrical power to operate the pump and the timing systems. The sampling system consist of two seven-day timers which activate a metal bellows pump, elapsed time meters, and a canister specific two-way solenoid valve. All sampling lines are constructed of 1/8" ID gas chromatography grade stainless steel tubing. The upper level sampling probes extend 2 meters to the southwest from the tower and the ground level probe is located 8 feet above the ground extending approximately 4 feet from the building located at the base of the tower.

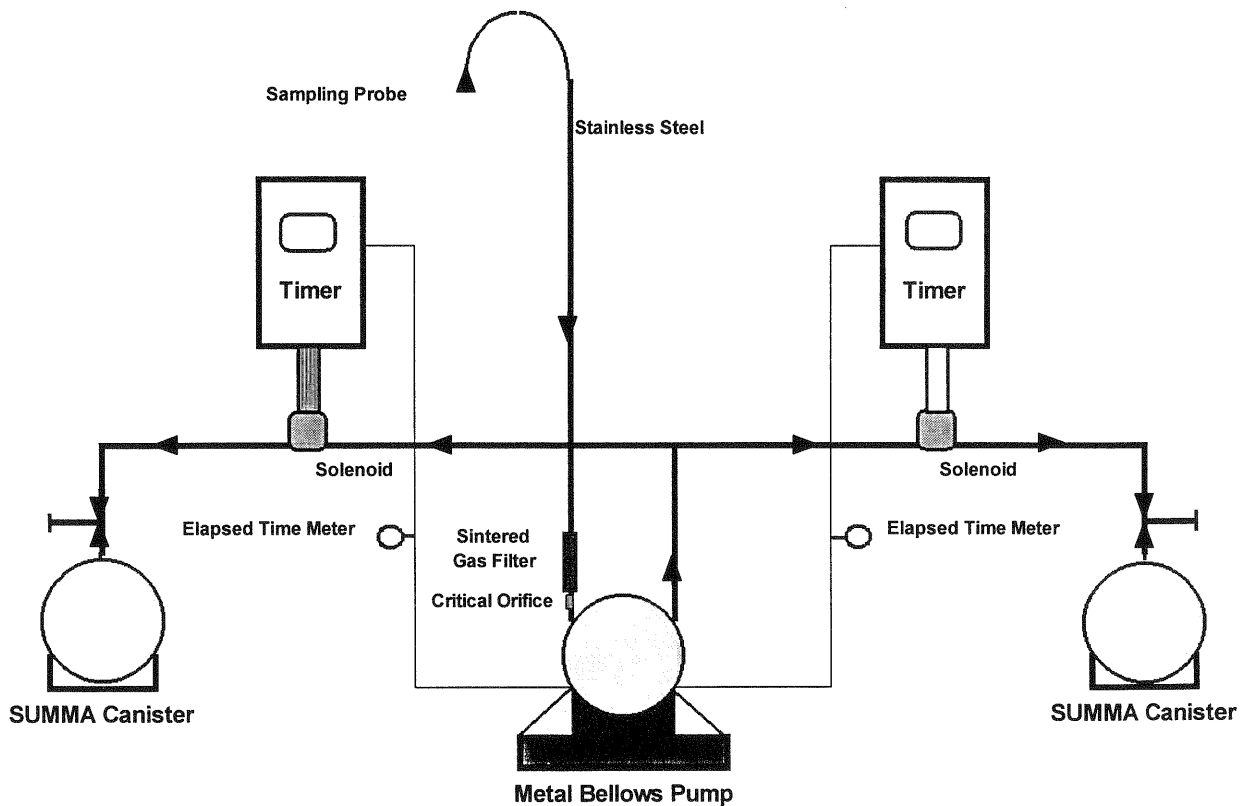


Figure 4. Hydrocarbon Sampling System

#### 4.1 Volatile Organic Compound Analytical Procedure

The ambient air samples collected in the passivated stainless steel Summa™ canisters using the sampler described above are analyzed at the Ambient Monitoring Section Hydrocarbon Speciation Laboratory in Raleigh. In addition to the PAMS hydrocarbon sampling sites operated by NC, this laboratory also analyzes the samples collected by locally operated programs.

The instrumentation used to analyze the ambient air samples for the targeted C2 through C12 hydrocarbons (ethane through dodecane) is a two-column dual Flame Ionization Detector (FID) gas chromatograph. The target compounds are identified by comparison to retention times of the known compounds included in the calibration standard. This standard provided by the EPA is used for both peak identification and for determining the concentration of each respective compound. The two columns are a 50 m x 0.32 mm Al<sub>2</sub>O<sub>3</sub>/Na<sub>2</sub>SO<sub>4</sub> Plot™ column and a 50 m x 0.22 mm Reste™ methyl silicone column each of which is directed to a dedicated FID for the efficient separation and identification of each compound. The Plot™ column is used to separate the ethane (C2) through 1-Hexene (C6) and the Methyl Silicone column is used to separate Hexane (C6) through Dodecane (C12).

The 600 cc sample passes through a Nafion Drier to remove the moisture from the sample. Moisture has a detrimental effect on the Plot™ column and must be removed prior to the column. The sample then is transferred into an automatic thermal desorption system that uses an electrically cooled packed cold trap to produce a concentrated sample prior to injection. The rapid heating (40 °C/sec.) of the cold trap ensures efficient injection of the sample onto the analytical column. The gas chromatograph oven is then temperature ramped in two stages up to 200 °C. The detectors are maintained in an isothermal condition at 250 °C. As compounds elute from each specific column, the dedicated detector response is proportional to the concentration of each compound. The greater the concentration of a compound in the sample, the greater the detector response. The detector response is then compared to the detector response to a known concentration of that compound found in the calibration standard to determine the concentration in the sample. The concentration of the compound in the sample is reported as parts per billion carbon (ppbc).

A total of 57 compounds are identified by this chromatographic technique. These compounds are methane and the 56 PAMS target compounds. The results are reported for each individual PAMS target compound and grouped as Total Non-Methane Organic Compounds, NMOC, which includes any unknown compounds (which also are quantified as ppbc based upon detector response but not identified) and the total of known compounds. The list of PAMS 56 targeted organic compounds is presented in Table 3.

Table 3. Target Volatile Organic Compounds

METHANE	2-METHYLPENTANE	OCTANE
ETHANE	3-METHYLPENTANE	ETHYLBENZENE
ETHYLENE	ISOPRENE	M/P-XYLENE
PROPANE	1-HEXENE	STYRENE
PROPYLENE	HEXANE	O-XYLENE
ISOBUTANE	METHYLCYCLOPENTANE	NONANE
BUTANE	2,4-DIMETHYLPENTANE	ISOPROPYLBENZENE
ACETYLENE	BENZENE	N-PROPYLBENZENE
TRANS-2-BUTENE	CYCLOHEXANE	M-ETHYLTOLUENE
1-BUTENE	2-METHYLHEXANE	P-ETHYLTOLUENE
CIS-2-BUTENE	2,3-DIMETHYLPENTANE	1,3,5-TRIMETHYLBENZENE
CYCLOPENTANE	3-METHYLHEXANE	O-ETHYLTOLUENE
ISOPENTANE	2,2,4-TRIMETHYLPENTANE	1,2,4-TRIMETHYLBENZENE
PENTANE	HEPTANE	DECANE
TRANS-2-PENTENE	METHYLCYCLOHEXANE	1,2,3-TRIMETHYLBENZENE
1-PENTENE	2,3,4-TRIMETHYLPENTANE	M-DIETHYLBENZENE
CIS-2-PENTENE	TOLUENE	P-DIETHYLBENZENE
2,2-DIMETHYLBUTANE	2-METHYLHEPTANE	UNDECANE
2,3-DIMETHYLBUTANE	3-METHYLHEPTANE	DODECANE

#### 4.2 Volatile Organic Compound Calibration

The PAMS 56 component calibration standard is analyzed each day prior to analysis of the samples collected in the field. This standard is obtained from Scott Specialty Gases. Via this standard, which ranges in concentration from 21 ppbc to 62 ppbc, individual compound response factors are determined. These organic species response factors are used in subsequent sample analysis to determine the concentration of each compound in the sample.

#### 4.3 Volatile Organic Compound Sampling Period

During 1999, PAMS volatile organic compound samples were collected at eight different sites throughout NC. The Tower site is one of these sites. Due to limited access to the upper levels of the tower, samples were collected once per week from the

period of May 31 through September 8, 1999. PAMS hydrocarbon samples were collected simultaneously at all levels at the same time on the same day. Through the use of the seven-day timers the day of sampling was pre-programmed based on long range weather forecast in order to coincide with warm clear days with the greatest ozone formation potential. Three-hour integrated hydrocarbon samples were collected in the morning (6 am - 9 am) and the afternoon (2 pm - 5 pm) at all levels. The sampling days and samples collected are listed in Table 4.

Table 4. Hydrocarbon Sampling Days

Date	Ground Level		820 Feet Level		1420 Feet Level	
	AM	PM	AM	PM	AM	PM
05/31	AM	PM	AM	-0-	AM	PM
06/14	AM	PM	AM	PM	AM	PM
06/21	AM	-0-	AM	-0-	AM	PM
06/28	AM	PM	AM	-0-	AM	PM
07/05	-0-	PM	AM	PM	AM	PM
07/10	AM	PM	AM	-0-	AM	PM
07/19	AM	PM	AM	-0-	-0-	PM
07/26	AM	PM	AM	-0-	-0-	PM
07/30	AM	PM	AM	PM	-0-	PM
08/06	AM	PM	AM	-0-	AM	PM
08/13	AM	-0-	-0-	-0-	AM	-0-
08/24	AM	-0-	-0-	PM	-0-	PM
09/01	AM	PM	AM	PM	-0-	PM
09/08	AM	PM	-0-	PM	AM	PM

note: " -0-" denotes sample not successfully collected

Considerable sample collection difficulty was experienced at the 820 and 1420 feet levels throughout the season. The lost samples have been attributed to thunderstorm activity and power demand fluctuations.

## 5. Ozone and VOC Monitoring Results

### 5.1 Ozone Monitoring Results

During 1999, ozone was monitored at the Tower site throughout the late spring, summer, and early fall. The Tower enabled the Ambient Monitoring Section to monitor ozone on a continuous basis at ground level, 250 feet, 420 feet, and 1420 feet simultaneously. The ground level ozone monitor began collecting data on April 1 and operated until October 31, 1999. The 250 feet, the 420 feet, and the 1420 feet levels operated from May 14 until they were shut down on September 14, just prior to the effects of Hurricane Floyd, to protect the equipment. For the period of operation at this site, data completeness for each level exceeded 94%. It should be noted that a valid ozone monitoring season completeness is established as being greater than 75%. Table 5 below presents the monthly hourly average (Avg) and monthly hourly maximum (Max) for each monitoring level in parts per million.

Table 5. Monthly Average and Maximum Ozone Concentration (ppm) All Levels

	Ground		250 Ft		420 Ft		1420 Ft	
	Avg	Max	Avg	Max	Avg	Max	Avg	Max
<b>April</b>	0.042	0.086	NA	NA	NA	NA	NA	NA
<b>May</b>	0.039	0.100	0.052	0.107	0.056	0.106	0.062	0.108
<b>June</b>	0.039	0.123	0.046	<b>0.128</b>	0.047	<b>0.126</b>	0.057	0.121
<b>July</b>	0.042	<b>0.126</b>	0.052	0.124	0.054	0.123	0.064	<b>0.126</b>
<b>Aug</b>	0.046	<b>0.127</b>	0.056	0.122	0.059	<b>0.131</b>	0.061	0.124
<b>Sept</b>	0.030	0.089	0.040	0.090	0.041	0.088	0.046	0.087
<b>Oct</b>	0.019	0.063	NA	NA	NA	NA	NA	NA

The monthly average ozone concentrations show a pattern of increasing concentration with height for each month for which data are available. The maximum concentrations do not exhibit the same pattern of increasing with height. This is expected, for the ozone maximums occur during the afternoon when the air column is well mixed. The historical 1-hour ozone standard (>0.125 ppm) was exceeded at the Tower twice at the ground level and 4 times at the upper levels during 1999. The old 1-hour standard was exceeded 20 times across the state in 1999 including eight times in the immediate Raleigh area including the Tower.

In 1997, the EPA revised the National Ambient Air Quality Standard for ozone to >0.08 ppm measured over eight hours. The standard is attained when the expected number of days per year on which the average fourth highest concentration exceeds this by at least 0.005 ppm is equal to or less than one. An average of the fourth highest ozone concentrations for each year over a three year period is used to determine whether an area is in or out of compliance. Effectively the new ozone standard for an overlapping 8-hour average has been established at 0.085 ppm. In 1999 there were 541 exceedances of the new 8-hour ozone standard at the 45 statewide reporting monitoring sites on 68 days. Of these exceedances, 22 were from the ground level ozone monitor located at the Tower. The other upper levels (250 ft., 420 ft., and 1420

ft.) monitoring ozone at this site do not meet the siting criteria as specified by the EPA, and thus were not reported to the EPA nor included in the statewide totals. Table 6 provides a list of all the 8-hour exceedances at the ground level monitor and the 8-hour averages at the upper levels that were also greater than or to 0.084 ppm ozone.

Table 6. 1999 Ozone Exceedances and Upper Level 8-Hour Averages >0.084 ppm.

	Ground	>0.084	250 Ft	>0.084	420 Ft	>0.084	1420 Ft	>0.084
21-May	0.081		0.086	1	0.083		0.090	1
28-May	0.089	1	0.098	1	0.097	1	0.100	1
29-May	0.087	1	0.095	1	0.095	1	0.098	1
30-May	0.076		0.081		0.081		0.086	1
08-Jun	0.105	1	0.109	1	0.108	1	0.104	1
09-Jun	0.092	1	0.098	1	0.099	1	0.097	1
10-Jun	0.098	1	0.106	1	0.105	1	0.101	1
05-Jul	0.084		0.086	1	0.086	1	0.090	1
06-Jul	0.102	1	0.102	1	0.106	1	0.105	1
08-Jul	0.084		0.083		0.082		0.088	1
20-Jul	0.106	1	0.109	1	0.111	1	0.109	1
22-Jul	0.094	1	0.096	1	0.094	1	0.095	1
23-Jul	0.080		0.091	1	0.091	1	0.094	1
24-Jul	0.062		0.074		0.082		0.098	1
26-Jul	0.084		0.086	1	0.084		0.087	1
27-Jul	0.095	1	0.109	1	0.111	1	0.113	1
28-Jul	0.094	1	0.095	1	0.095	1	0.102	1
30-Jul	0.095	1	0.096	1	0.095	1	0.095	1
31-Jul	0.094	1	0.093	1	0.094	1	0.099	1
01-Aug	0.093	1	0.092	1	0.090	1	0.086	1
03-Aug	0.086	1	0.089	1	0.089	1	0.087	1
05-Aug	0.101	1	0.102	1	0.100	1	0.099	1
06-Aug	0.102	1	0.103	1	0.103	1	0.103	1
07-Aug	0.099	1	0.098	1	0.098	1	0.099	1
11-Aug	0.084		0.086	1	0.085	1	0.086	1
12-Aug	0.107	1	0.103	1	0.100	1	0.108	1
18-Aug	0.111	1	0.116	1	0.118	1	0.117	1
19-Aug	0.088	1	0.089	1	0.088	1	0.087	1
27-Aug	0.088	1	0.098	1	0.097	1	0.103	1
28-Aug	0.085	1	0.085	1	0.084		0.087	1
<b>Total # &gt;0.084</b>		<b>22</b>		<b>27</b>		<b>24</b>		<b>30</b>

It should be noted that:

1. For 21 days, the 8-hour average was greater than 0.08 ppm at all levels.
2. In 4 days the 8-hour average at the 1420 feet level exceeded 0.08 ppm when any of the other levels did not exceed that concentration.
3. There were no days when either of the three lower levels exceeded 0.08 ppm and the upper level did not exceed that concentration.
4. On seven days, the 8-hour average concentration at the ground level did not exceed 0.084 ppm when at least one of the upper levels did exceed that concentration.

Table 7 presents 24-hour average ozone concentrations at the four levels monitored for selected dates. These dates were chosen because at least one of the levels maintained an average 24-hour concentration greater than the new 8-hour average ozone standard of >0.084 ppm. The most frequent occurrence of a 24-hour average greater than this new 8-hr average 0.08 ppm standard value was at the 1420 feet level.

Table 7. 24-Hour Average Ozone Concentrations > 0.084 ppm

	<b>G r o u n d</b>	<b>2 5 0 F e e t</b>	<b>4 2 0 F e e t</b>	<b>1 4 2 0 F e e t</b>
<b>M a y 2 9</b>	0.057	0.084	<b>0.086</b>	<b>0.092</b>
<b>J u n e 8</b>	0.063	0.077	0.078	<b>0.088</b>
<b>J u n e 9</b>	0.056	0.080	0.083	<b>0.090</b>
<b>J u n e 1 0</b>	0.057	0.080	0.079	<b>0.088</b>
<b>J u l y 2 0</b>	0.059	0.074	0.071	<b>0.085</b>
<b>J u l y 2 7</b>	0.045	0.075	<b>0.085</b>	<b>0.097</b>
<b>J u l y 2 8</b>	0.058	0.076	<b>0.085</b>	<b>0.092</b>
<b>J u l y 3 1</b>	0.064	0.075	0.077	<b>0.085</b>
<b>A u g 5</b>	0.069	0.076	0.079	<b>0.090</b>
<b>A u g 6</b>	0.063	0.080	0.081	<b>0.090</b>
<b>A u g 7</b>	0.060	0.075	0.079	<b>0.085</b>
<b>A u g 1 8</b>	0.062	0.082	<b>0.085</b>	<b>0.099</b>

There is a definite pattern of lowest to highest concentration when going from ground level to the 1420 feet level for these dates. For each of these twelve days when the 24-

hour average ozone concentration at the 1420 feet was greater than the new standard, there was an ozone exceedance reported for the ground level monitor. The average ground level exceedance for these dates was 0.098 ppm ozone.

Figure 5 below shows the hourly ozone concentration data from 6 am July 26 through 6 pm July 28 (two of the dates from Table 7) for both the ground level and the 1420 feet levels. This is representative of the classical cycle of formation and depletion of ground level ozone. For presentation purposes only, the calibration cycles, 3 and 6 am, have been removed from this plot. The ground level ozone concentration begins increasing at 6 am, builds to a maximum value in the mid to late afternoon, and slowly declines throughout the evening hours.

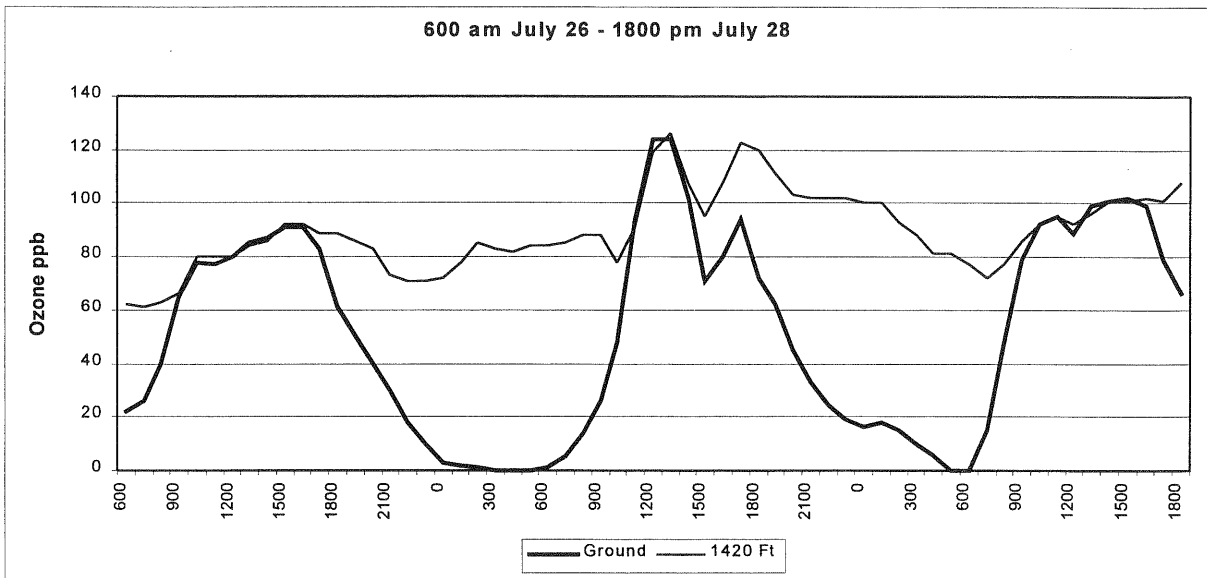


Figure 5. Tower Diurnal Cycle

In contrast, the 1420 feet level ozone concentration over this time period remains relatively constant at a considerably higher concentration. From late morning through early afternoon, the ozone concentrations at both levels are virtually identical.

A complete reporting set of Hourly Average Ozone data for each level and monitoring period is included in Appendix A. The following identifies the sampling elevation under the Parameter identifier in the Hourly Average Report in these reports.

Parameter	O3	Ground Level
"	M2	250 Feet
"	M4	420 Feet
"	Hi	1420 Feet



## 5.2 Volatile Organic Compound Results

Ambient air samples were collected for Volatile Organic Compound (VOC) analysis in the morning and afternoon from May 31 through September 8 at three levels of the Tower. These levels were ground level, 820 feet, and 1420 feet. The samples were analyzed the following week at the Ambient Monitoring Hydrocarbon Laboratory. A total of 63 samples were successfully collected, analyzed, and are included in this report. There were 24 samples collected at ground level, 17 samples at the 820 feet level, and 22 samples at the 1420 feet level. The collection of nine samples from the morning sampling period and 12 samples from the afternoon sampling period was unsuccessful. The data from the analysis of the ground level samples were reported to the EPA. The upper level samples were not reported to the EPA because these levels do not meet the EPA siting criteria.

The Total VOC determined in a sample includes methane, the 56 PAMS Target Compounds, and all compounds detected and quantified but not identified. The Total Non-Methane Organic Compounds is reported after the methane fraction has been removed from the Total VOC determination. The Total Unknown is the sum of the reported but unidentified portion of the sample. A summary of the results for the 1999 sample set in 1999 is in Table 8.

Table 8. Total VOC, NMOC, and Unknown, Min, Max, and Median Concentration (ppbC)

		<u>Ground</u>		<u>820 Feet</u>		<u>1420 Feet</u>	
		<u>Am</u>	<u>Pm</u>	<u>Am</u>	<u>Pm</u>	<u>Am</u>	<u>Pm</u>
<b><u>Number of Samples</u></b>		<b>13</b>	<b>11</b>	<b>11</b>	<b>7</b>	<b>9</b>	<b>13</b>
<b><u>Total VOC</u></b>	<u>min</u>	73	79	54	39	52	57
	<u>max</u>	272	168	126	163	174	106
	<b><u>Median</u></b>	<b>99</b>	<b>107</b>	<b>71</b>	<b>91</b>	<b>65</b>	<b>81</b>
<b><u>Total NMOC</u></b>	<u>min</u>	32	50	14	11	23	20
	<u>max</u>	233	139	83	133	141	60
	<b><u>Median</u></b>	<b>69</b>	<b>67</b>	<b>34</b>	<b>62</b>	<b>32</b>	<b>46</b>
<b><u>Total Unknown</u></b>	<u>min</u>	0	1	0	0	1	1
	<u>max</u>	8	9	4	10	10	10
	<b><u>Median</u></b>	<b>2</b>	<b>1</b>	<b>2</b>	<b>2</b>	<b>3</b>	<b>6</b>

The median NMOC concentration shows a distinct difference between the ground and upper levels in the morning samples. The ground level is roughly twice the concentration of both the 820 and 1420 concentrations. The median concentration for afternoon samples show a different relationship. Even though the concentration at all levels is greater in the afternoon both the ground and 820 foot level are a third greater

than the 1420 foot level. The Unknown Fraction in all samples on a per level basis shows the least variability, with a slight downward trend.

The identified NMOC fraction (the PAMS 56 Target Compounds) can be further broken down into the common classification of Paraffinic, Olefinic, and Aromatic compounds (AOP). There are 29 paraffins, 10 olefins, and 16 aromatics in the target compounds (which excludes methane). Acetylene, an alkyne, is the only target compound that does not fit into this classification and is listed separately in Table 9.

Table 9. Paraffin, Olefin, and Aromatic Distribution of Targeted Compounds

		<u>Paraffins</u>		<u>Olefins</u>		<u>Aromatics</u>		<u>Acetylene</u>	
		<u>am</u>	<u>pm</u>	<u>am</u>	<u>pm</u>	<u>am</u>	<u>pm</u>	<u>am</u>	<u>pm</u>
<b><u>Ground</u></b>	min	8	14	2	9	11	12	0	0
	max	124	52	43	48	66	36	3	2
	<b>Median</b>	<b>24</b>	<b>18</b>	<b>9</b>	<b>27</b>	<b>33</b>	<b>15</b>	<b>1</b>	<b>1</b>
<b><u>820 Feet</u></b>	min	5	4	1	4	7	4	1	1
	max	28	28	27	27	25	86	31	2
	<b>Median</b>	<b>13</b>	<b>20</b>	<b>4</b>	<b>7</b>	<b>9</b>	<b>22</b>	<b>1</b>	<b>1</b>
<b><u>1420 Feet</u></b>	min	10	9	2	3	6	3	0	0
	max	90	38	11	11	28	22	21	2
	<b>Median</b>	<b>11</b>	<b>19</b>	<b>2</b>	<b>5</b>	<b>7</b>	<b>8</b>	<b>0</b>	<b>1</b>

\*note: results in ppbc

The vertical distribution pattern and relationships for the Paraffin and Aromatic compound classes is the same as total NMOC in the morning and afternoon samples. These two classes dominate the composition in the morning samples, but the Olefin fraction is the largest component at the ground level in the afternoon. It should also be noted that at all three levels the olefinic fraction increases from morning to afternoon. The seasonal acetylene levels were equal. An exception occurred with the maximum concentrations on the morning of June 21 at both the 820 and 1420 feet levels. These two morning samples had exceptionally high acetylene concentrations of 31 ppbc at the 820 feet level and 21 ppbc at the 1420 feet level. During 1999, a new 2000 feet+ tower was being constructed approximately 1000 meters to the southeast of the Auburn Tower. It is believed these exceptionally high acetylene concentrations are related to metal working activities on this new tower.

The major component of the Olefin fraction is **Isoprene**, which is greater in the afternoon samples at all levels. Isoprene is a highly photochemically reactive biogenic compound emitted by trees and grasses especially during warm weather. Figure 6. shows the morning and afternoon median concentration of isoprene and the other olefinic compounds for the samples collected in 1999. Isoprene dominates both the ground level and 1420 feet olefin fractions.

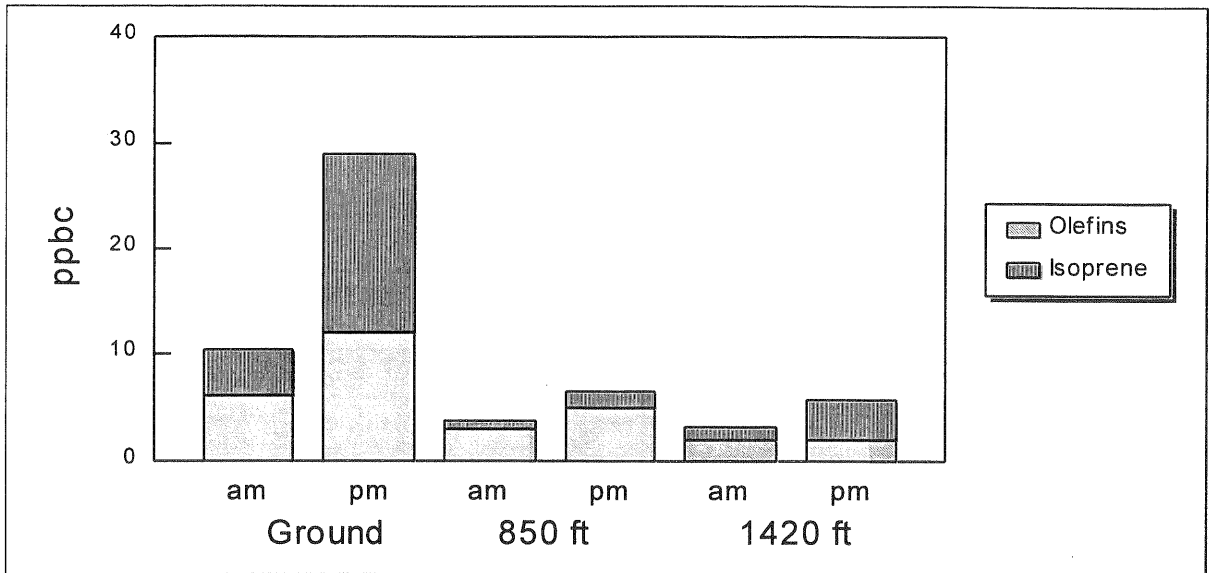


Figure 6. Diurnal Isoprene Pattern

All samples were analyzed for the 56 PAMS Target Compounds, methane, and unidentified components. Of the 57 compounds identified by this analytical technique, 16 compounds were found over 50% of the time in all samples. These compounds of highest frequency of detection range from methane (C1) through undecane (C11) and the percent detected is shown in Table 10.

Table 10. Most Frequently Detected Target Compounds

Compound	Tower Ground		820 Feet		1420 Feet	
	AM	PM	AM	PM	AM	PM
METHANE	100	100	100	100	100	100
ETHANE	100	100	100	100	100	100
ETHYLENE	100	100	82	86	78	77
PROPANE	100	100	100	100	100	100
PROPYLENE	92	82	91	86	100	69
ISOBUTANE	100	100	64	57	56	92
BUTANE	100	100	91	86	89	100
ACETYLENE	92	91	100	100	67	100
ISOPENTANE	100	91	100	100	100	100
PENTANE	100	100	100	86	100	100
2-METHYLPENTANE	100	91	55	57	56	54
ISOPRENE	92	100	100	100	89	100
BENZENE	85	100	91	86	78	85
TOLUENE	100	100	100	100	100	100
M-ETHYLTOLUENE	77	82	55	57	78	54
UNDECANE	85	64	82	86	78	69

note: Percent (%) found in samples

Table 11 below list the median 1999 concentration for each compound. In the morning samples, 54 of the PAMs target compounds were detected at the ground level, with 40 at the 820 foot level, and 46 at the 1420 foot level. In the afternoon samples, 49 of these compounds were detected and reported at the ground level, 47 compounds at the 820 foot level, and 48 compounds at the 1420 foot level.

Table 11. Median Target Compound Hydrocarbon Concentrations (ppbc)

	Morning			Afternoon		
	Ground	820'	1420'	Ground	820'	1420'
METHANE	32.5	36.3	34.7	36.7	30.0	35.1
ETHANE	4.5	3.4	2.9	4.1	2.9	2.9
ETHYLENE	2.3	0.8	0.8	2.4	1.0	0.7
PROPANE	4.2	2.5	2.0	2.8	3.4	2.0
PROPYLENE	1.6	0.6	0.4	3.9	0.8	0.4
ISOBUTANE	1.1	0.7	0.5	1.0	0.6	0.4
BUTANE	1.8	1.1	0.8	1.7	1.4	1.0
ACETYLENE	1.3	1.1	0.9	1.5	1.3	1.3
TRANS-2-BUTENE						
1-BUTENE			0.4	0.3		0.3
CIS-2-BUTENE						
CYCLOPENTANE						
ISOPENTANE	2.6	1.9	1.2	2.1	1.6	1.4
PENTANE	1.4	0.7	0.7	1.2	1.6	0.6
TRANS-2-PENTENE						
1-PENTENE						
CIS-2-PENTENE						
2,2-DIMETHYLBUTANE						
2,3-DIMETHYLBUTANE						
2-METHYLPENTANE	0.6	0.4	0.3	0.5	0.3	0.3
3-METHYLPENTANE						
ISOPRENE	4.2	0.8	0.9	17.0	1.5	3.7
1-HEXENE						
HEXANE	0.4				0.4	
METHYLCYCLOPENTANE						
2,4-DIMETHYLPENTANE						
BENZENE	2.0	2.5	1.4	1.3	1.4	1.2
CYCLOHEXANE						
2-METHYLHEXANE						
2,3-DIMETHYLPENTANE						
3-METHYLHEXANE	0.6					
2,2,4-TRIMETHYLPENTANE	1.9	0.0	0.6	5.5		0.8
HEPTANE					1.4	
METHYLCYCLOHEXANE				0.4		
2,3,4-TRIMETHYLPENTANE				0.6		
TOLUENE	17.8	2.1	5.7	8.0	4.4	4.0
2-METHYLHEPTANE						
3-METHYLHEPTANE						
N-OCTANE			2.6		0.8	2.7
ETHYLBENZENE					0.9	
M/P-XYLENE	1.5	1.1			3.7	
STYRENE						
O-XYLENE	0.6				1.9	
NONANE						
ISOPROPYLBENZENE						
N-PROPYLBENZENE						
M-ETHYLTOLUENE	1.4	0.6	0.9	0.5	0.7	0.4
P-ETHYLTOLUENE						
1,3,5-TRIMETHYLBENZENE						
O-ETHYLTOLUENE						
1,2,4-TRIMETHYLBENZENE	5.7	1.9		3.4	2.3	
DECANE						
1,2,3-TRIMETHYLBENZENE	1.6	0.9	0.3	1.5	4.0	
M-DIETHYLBENZENE						
P-DIETHYLBENZENE						
UNDECANE	1.0	1.6	2.6	0.8	1.0	2.1
DODECANE	0.4					
Unknowns	2.1	1.7	3.2	1.1	1.5	5.6

Figure 7 compares the ground level median concentration for the morning and afternoon samples. Target compounds that did not change in concentration are not displayed. This plot shows the large increase in Isoprene and large decrease in Toluene concentration from morning to afternoon. The other compounds that show

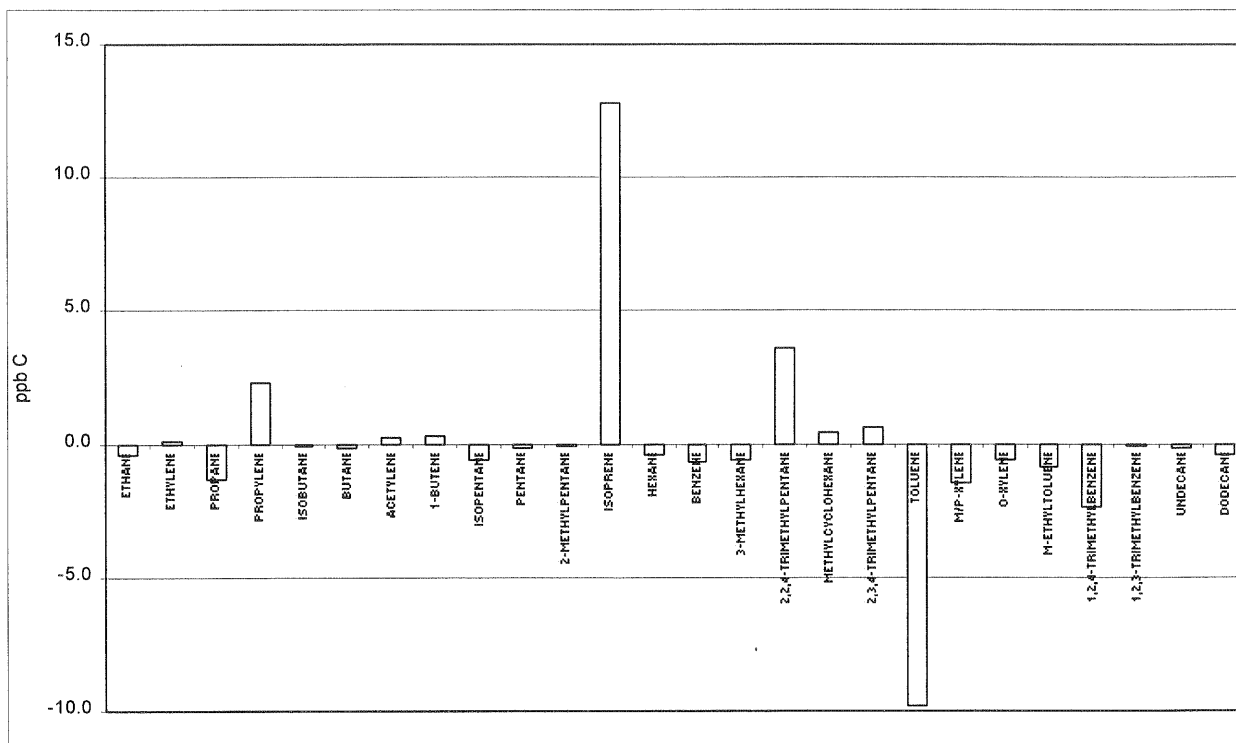


Figure 7. Change in Ground Level Concentrations from Morning to Afternoon

an increase from morning to afternoon at the ground level are Ethylene, Propylene, Acetylene, 1-Butene, 2,2,4-Trimethylpentane, Methylcyclohexane, and 2,3,4-Trimethylpentane.

The next two figures present the same comparisons at the 820 and 1420 feet levels for morning to afternoon median concentrations. In Figure 8, the morning to afternoon comparison for the 820 feet samples shows a different pattern than the ground level with a large number of compounds increasing in concentration in the afternoon. A total of 17 compounds increased in concentration at the 820 feet level in the afternoon. The increase in isoprene concentration in the afternoon was less than 1.0 ppb carbon. Toluene increased in concentration in the afternoon, whereas it decreased in the ground level comparison.

At the 1420 feet level, the afternoon concentration of seven target compounds increased as shown in Figure 9. Isoprene showed the greatest increase and Toluene showed the greatest decrease. This is a similar pattern as the ground level but the magnitude of change at the ground level is larger.

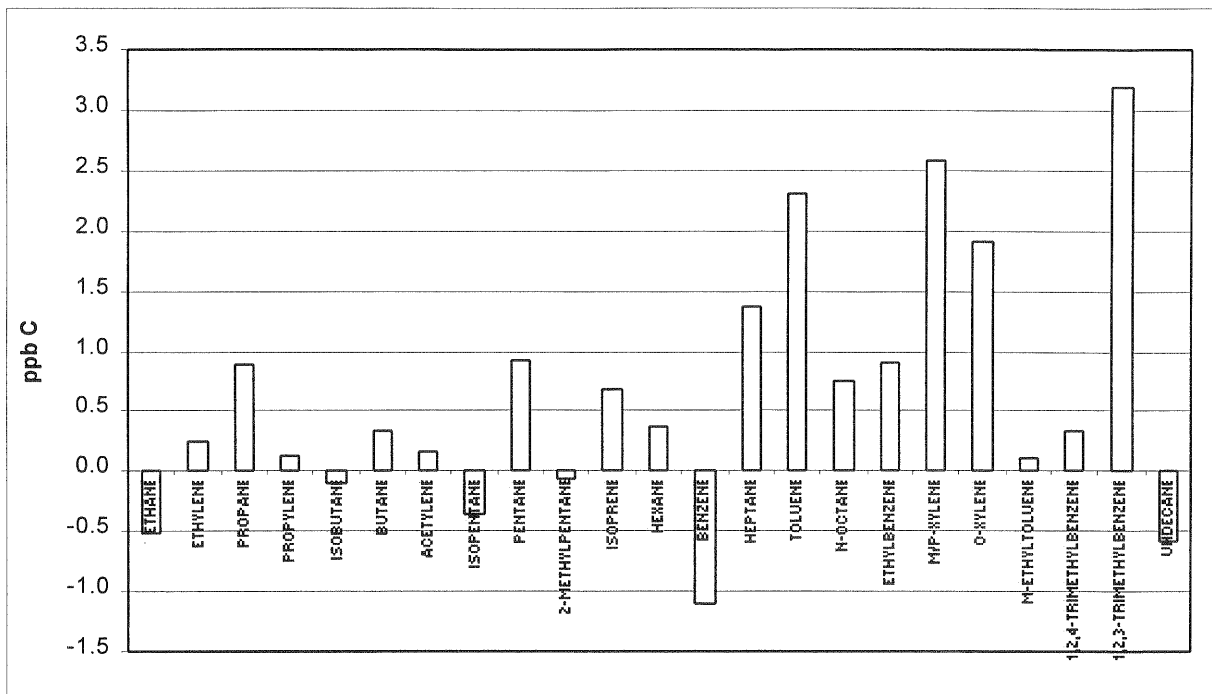


Figure 8. 820 Feet Level Change in Concentrations from Morning to Afternoon

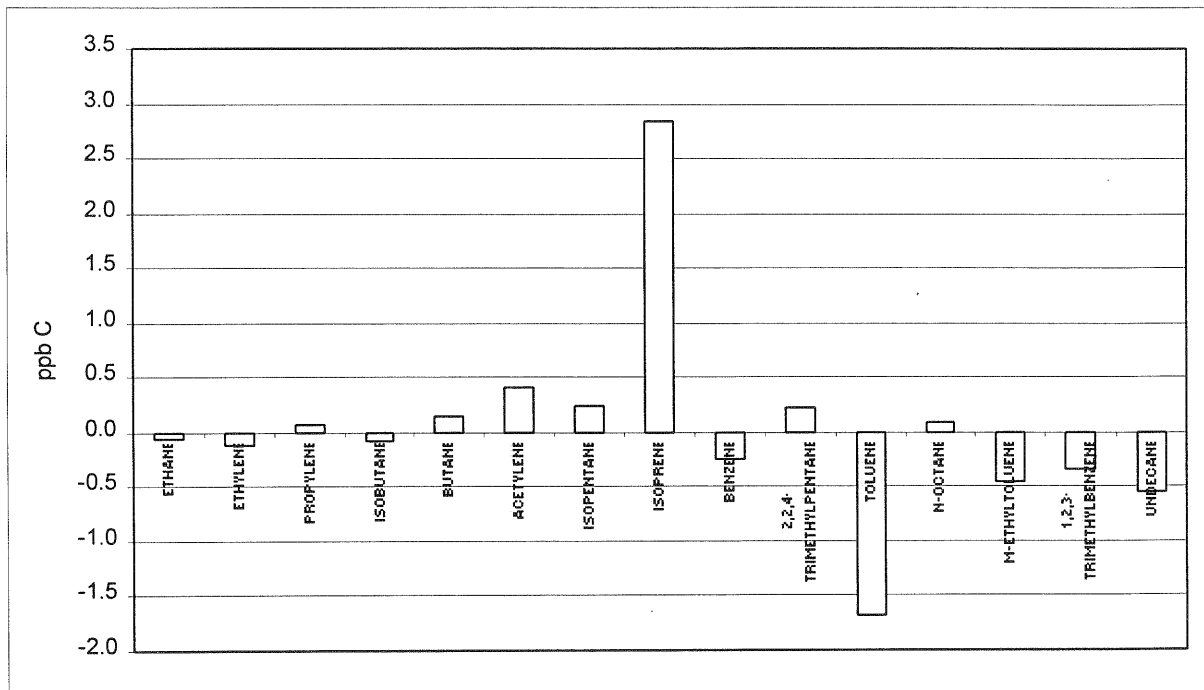


Figure 9. 1420 Feet Level Change in Concentrations from Morning to Afternoon

Figure 10 compares the composition and concentration of both the ground level and 820 feet level to the 1420 feet level for the PAMS Target compounds. This figure only contains the compounds where a detected difference in concentration was found. Using Toluene for an example this figure shows the ground level concentration of Toluene to be far greater than the concentration at the 1420 feet level. Likewise, this figure shows the concentration of Toluene to be greater at 1420 feet than the concentration of Toluene at the 820 feet level during the morning sampling period. In most cases, both the ground level and the 820 feet level are more concentrated for each compound than the 1420 feet level. Three compounds were found to have a

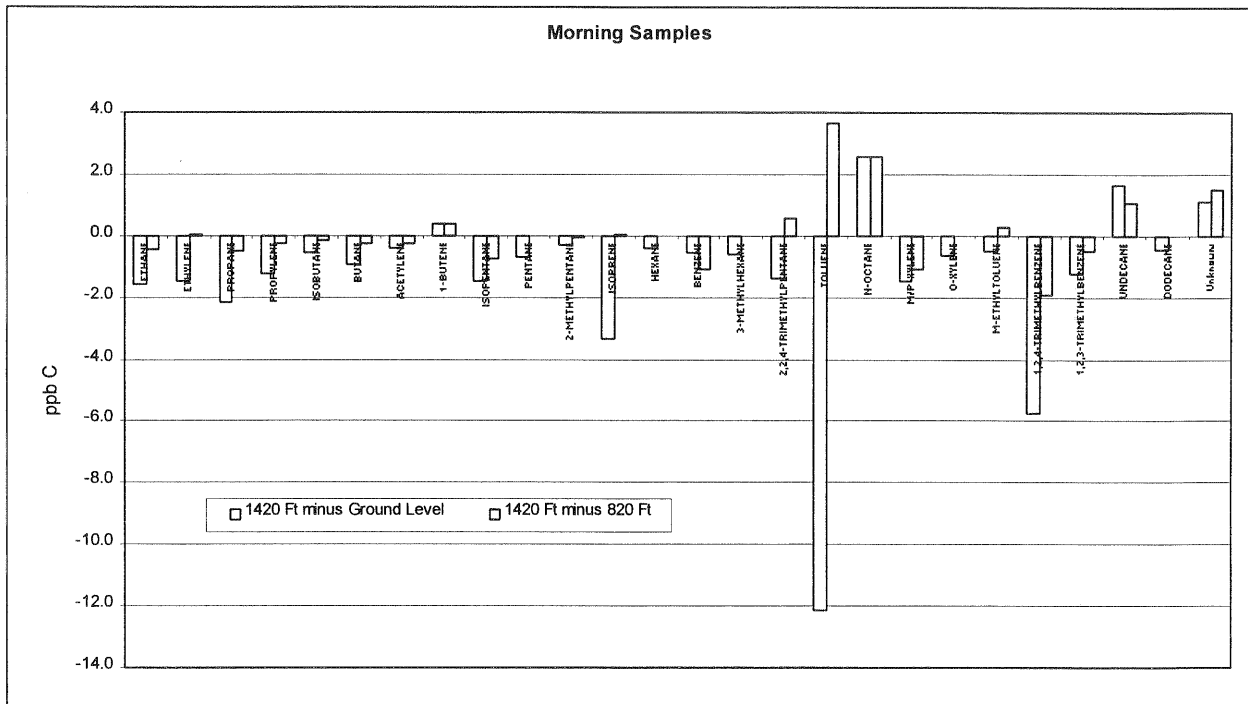


Figure 10. Comparison of Morning PAMS Concentrations

higher morning median concentration at the 1420 feet level than at either the ground or the 820 feet level. These compounds are 1-butene, N-Octane, and Undecane. Another four compounds were found to have a higher median concentration at the 1420 feet level than the 820 feet level but not the ground level. The unknown component of the 1420 feet level is greater than either of the other two levels.

Figure 11 shows the same comparison for the afternoon samples. In addition to the same three compounds that were at a higher concentration in the morning samples for the 1420 feet level Isoprene shows a large increase at the upper level in comparison to the 820 feet level.

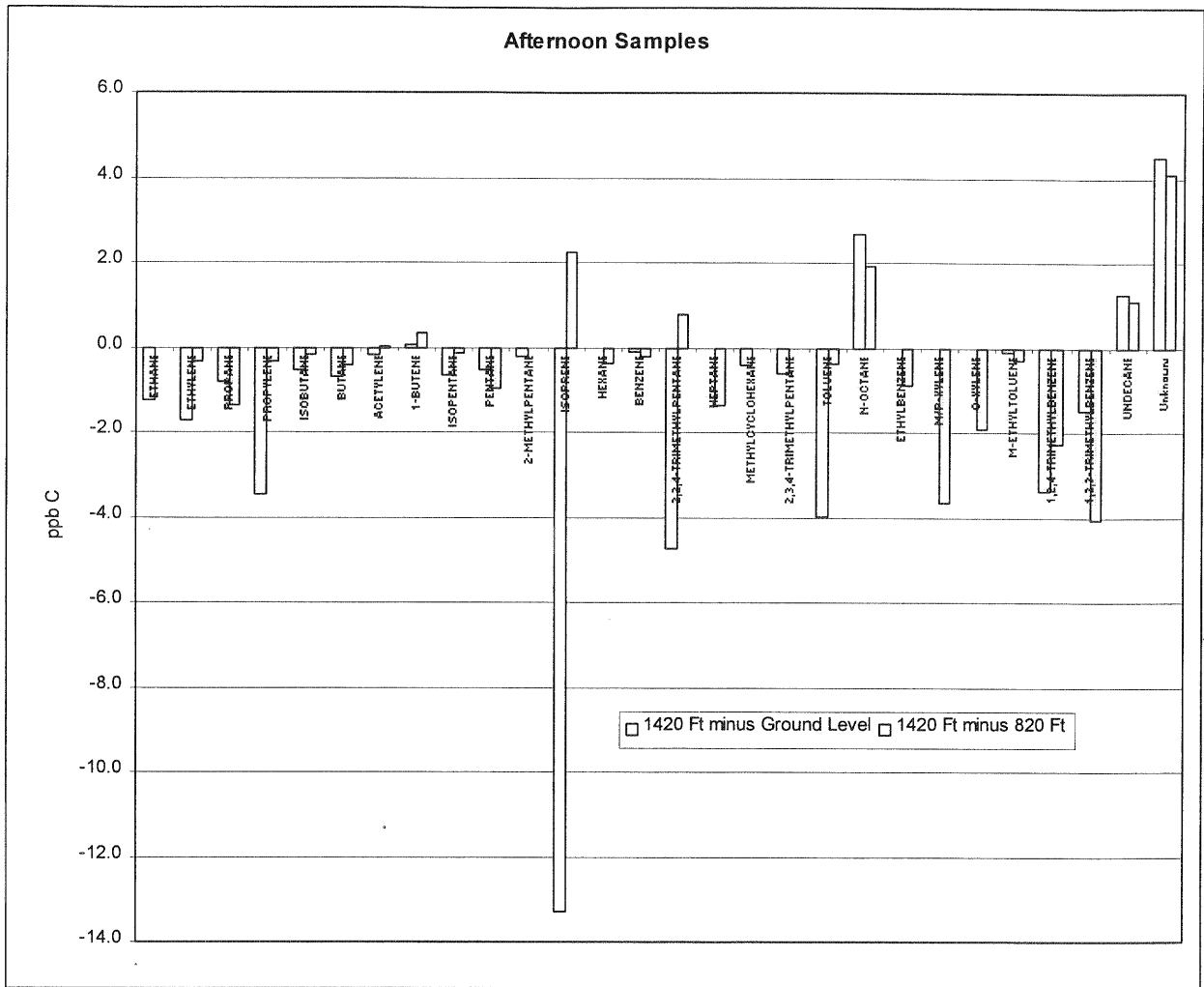


Figure 11. Comparison of Afternoon PAMS Concentrations

The complete set of the PAMS Hydrocarbon Speciation Reports for each level for each of the 13 sampling days in 1999 is included in Appendix B.



**6. Requests For Electronic Copies Of The Data**

The data used in this summary report are available on request the data from:

Tom Manuszak  
Ambient Monitoring Section  
Division of Air Quality  
NC Dept of Environment and Natural Resources  
1641 Mail Service Center  
Raleigh, NC 27699-1641  
Phone: (919) 715-0665

## **Appendix A**

### **Monthly Ozone Hourly Reports**

-----  
 ESCSYS AIR QUALITY MONITORING SYSTEM  
 -----

( 1 HOUR RUNNING AVERAGES)

Validated Database

AIRS CODES

SITE .....WRALTOWR  
 PARAMETER ....03  
 MONTH .....May 99  
 UNITS .....PPM X (10 ^ 3)

TRANSACTION CODE: 1  
 STATE CODE: 37  
 INTERVAL CODE: 1

SITE CODE: 0017  
 COUNTY CODE: 183  
 UNITS CODE: 007

PARAMETER CODE: 44201  
 PARM OCC CODE: 1  
 METHOD CODE: 019

DAY	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	MAX	RDS
1	47	47	47-999	44	41	39	39	39	40	43	43	46	47	49	50	49	48	48	47	45	48	44	43	0.045	0.050	23	
2	46	46	45-999	43	44	44	43	42	43	44	47	50	50	50	51	49	48	48	47	46	42	36	30	0.047	0.063	23	
3	41	37	39-999	37	32	29	40	44	48	51	53	56	58	61	62	63	62	56	50	41	33	32	42	0.039	0.080	23	
4	21	15	14-999	4	0	0	20	26	33	39	44	55	67	72	77	80	77	58	50	41	33	32	42	0.041	0.074	23	
5	37	29	15-999	16	26	26	27	29	43	60	61	64	74	70	62	59	56	42	34	23	22	30	36	0.043	0.055	23	
6	47	46	40-999	31	28	24	24	25	43	41	51	53	50	52	55	55	55	53	51	40	43	40	38	0.038	0.051	23	
7	39	37	33-999	26	24	20	22	26	32	42	49	51	47	47	50	51	47	43	37	39	39	36	32	0.049	0.075	23	
8	29	29	29-999	22	22	22	27	37	46	54	62	68	73	74	72	72	75	72	61	53	44	39	38	0.048	0.077	23	
9	35	36	32-999	11	12	13	40	51	61	70	73	71	70	76	74	77	77	66	55	48	22	22	10	0.038	0.076	23	
10	0	0	0-999	1	17	25	37	43	49	57	65	71	73	74	76	76	70	57	39	23	6	5	7	0.048	0.080	19	
11	4	9	4-999	0	0-999	999-999	999-999	999-999	66	69	70	69	70	72	80	79	71	50	49	56	54	46	9	0.037	0.066	23	
12	47	34	22-999	6	0	9	35	46	53	60	64	66	64	61	52	52	40	31	31	26	22	16	9	0.040	0.084	23	
13	3	7	8-999	12	13	5	10	27	34	45	57	64	74	71	84	82	69	54	42	42	38	34	35	0.028	0.035	23	
14	33	28	25-999	27	29	30	29	29	33	35	35	34	33	29	26	25	24	23	23	24	24	25	25	0.033	0.045	23	
15	25	24	23-999	23	23	23	23	26	31	34	35	38	42	45	43	44	43	41	39	38	37	35	35	0.034	0.040	23	
16	34	33	33-999	31	32	29	29	30	31	34	37	39	40	39	39	40	40	39	37	32	30	29	27	0.025	0.037	23	
17	28	29	30-999	30	28	26	26	29	26	27	29	35	37	37	36	37	36	33	20	4	0	0	0	0.026	0.057	23	
18	0	12	12-999	6	1	14	24	36	40	43	43	46	49	53	56	57	55	40	21	0	0	1	0	0.020	0.051	22	
19	0	0	0-999	0	0	1	8	4-999	21	24	27	29	34	39	49	51	49	43	25	20	13	6	0.039	0.067	22		
20	24	24	27-999	27	26	27	32	42-999	51	56	62	66	66	67	67	63	52	37	25	4	8	2	0.045	0.090	23		
21	1	0	0-999	0	0	0	1	32	59	65	72	79	82	85	86	90	86	69	56	50	42	38	41	0.051	0.072	23	
22	33	30	28-999	32	32	34	48	55	60	64	66	69	72	71	70	66	55	57	52	46	38	39	53	0.051	0.064	23	
23	51	47	46-999	44	44	41	41	44	49	60	64	62	62	62	63	64	63	53	48	45	43	41	40	0.044	0.071	23	
24	36	27	22-999	35	35	31	31	32	38	47	53	56	60	69	71	67	66	59	50	45	37	27	23	0.037	0.060	20	
25	23	21	20-999	16	13	13-999	999-999	999-999	49	52	52	54	54	51	52	60	57	44	33	25	29	26	0.018	0.032	23		
26	20	12	14-999	3	0	0	0	0	8	19	28	29	31	32	27	31	29	26	24	24	22	18	17	0.045	0.066	23	
27	16	27	41-999	38	34	29	32	37	44	50	53	58	61	64	66	66	65	60	51	40	38	35	32	0.048	0.100	23	
28	22	6	1-999	0	0	1	20	33	52	66	73	80	89	95	98	100	99	79	60	33	29	31	29	0.056	0.089	23	
29	5	4	9-999	8	13	10	11	58	77	84	73	89	88	88	89	89	88	75	65	63	68	67	66	0.058	0.081	23	
30	60	54	42-999	38	38	39	42	53	59	69	76	80	81	79	76	76	73	67	58	49	48	39	42	0.042	0.068	23	
31	41	38	31-999	22	14	21	25	42	49	53	54	54	59	68	65	61	54	44	39	33	31	36	34	0.041			
AVG	27	25	24-999	20	20	21	27	35	44	50	54	57	60	61	61	62	60	52	44	36	32	30	29	0.041			
MAX	60	54	47-999	44	44	44	48	58	77	84	76	89	89	95	98	100	99	79	65	63	68	67	66	0.100			
DAYS	31	31	31	0	31	31	30	29	29	27	31	31	31	31	31	31	31	31	31	31	31	31	31	31			704

STANDARD DEVIATION 0.02128

NOTE: -999 INDICATES INVALID DATA OR LESS THAN 75 PERCENT VALID DATA INCLUDED

ESCSYS AIR QUALITY MONITORING SYSTEM

( 1 HOUR RUNNING AVERAGES)

Validated Database

AIRS CODES

SITE .....WRALTOWR  
 PARAMETER ....03  
 MONTH .....Apr 99  
 UNITS .....PPM X (10 ^ 3)

TRANSACTION CODE: 1      SITE CODE: 0017  
 STATE CODE: 37          COUNTY CODE: 183  
 INTERVAL CODE: 1        UNITS CODE: 007

PARAMETER CODE: 44201  
 PARM OCC CODE: 1  
 METHOD CODE: 019

DAY	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	MAX	RDS
1	44	43	42-999	41	41	40	39-999	999-999	999-999	999-999	999-999	999-999	999-999	999-999	999-999	999-999	999-999	999-999	999-999	999-999	27	24	21	23	4-999.000	0.044	11
2	21	24	25-999	24	26	21	22	23	34	43	48	50	52	54	56	55	45	30	6	0	0	1	30	0.030	0.056	23	
3	28	24	26-999	32	34	36	34	39	43	47	51	55	57	60	62	60	57	49	45	42	48	49	47	0.045	0.062	23	
4	45	45	45-999	39	40	40	38	41	43	43	43	42	42	45	44	44	44	47	45	33	27	27	25	0.040	0.047	23	
5	23	22	18-999	24	26	31	33	41	45	48	50	52	55	58	58	58	57-999	45	35	43	46	45	0.041	0.058	22		
6	41	34	26-999	14	1	16	19	37	41	44	41	47	45	47	46	37	33	36	40	40	37	35	33	0.034	0.047	23	
7	30	29	29-999	25	23	20	20	25	35	42	53	64	70	70	70	67	67	67	56	43	36	31	28	21	0.041	0.070	23
8	30	30	26-999	21	21	17	17	30	38	55	71	79	82	86	82	76	73	67	64	62	58	53	48	0.052	0.086	23	
9	43	39	37-999	32	28	25	24	30	33	39	44	46	46	47	49	51	52	53	52	50	49	48	54	0.042	0.054	23	
10	55	55	46-999	35	40	40	26	19	23	32	42	51	55	58	59	60	57	50	49	50	47	48	49	0.045	0.060	23	
11	45	44	45-999	41	41	37	37	36	35	38	41	46	43	41	46	47	46	28	17	18	16	48	63	0.039	0.063	23	
12	60	60	62-999	54	43	22	36	46	50	53	56	57	56	54	47	53	52	47	42	36	36	35	35	0.047	0.062	23	
13	35	34	33-999	23	11	12	25	33-999	999	48	51	54	58	61	62	61	55	47	33	27	29	27	0.039	0.062	21		
14	14	20	3-999	4	0	0	5	27	45	48	51	52	54	54	56	59	58	50	40	37	43	43	41	0.035	0.059	23	
15	41	39	34-999	26	16	5	7	20	40	42	36	54	62	54	53	55	54	51	46	42	40	28	20	0.038	0.062	23	
16	27	20	17-999	24	15	10	18	33	43	50	57	59	60	65	69	70	69	66	64	64	62	60	57	0.047	0.070	23	
17	53	52	47-999	31	30	27	36	43	47	48	48	53	57	59	60	62	62	58	59	55	47	46	47	0.049	0.062	23	
18	42	41	41-999	32	31	30	33	38	42	46	48	51	54	55	55	54	51	47	37	24	19	14	7	0.039	0.055	23	
19	3	2	7-999	3	0	0	8	19	26	43	52	56	59	61	62	65	66	55	43	38	35	30	30	0.033	0.066	23	
20	32	34	37-999	42	40	39	41	47	52	58	63	70	73	76	78	78	73	55	37	56	56	54	32	0.053	0.078	23	
21	45	40	38-999	19	8	7	31	40	44	53	50	57	71	76	80	81	82	66	53	49	49	49	46	0.049	0.082	23	
22	52	52	50-999	45	42	37	39	40	55	63	73	73	72	72	74	77	76	72	66	65	57	54	55	0.059	0.077	23	
23	54	53	48-999	39	37	35	34	38	43	54	65	69	67	65	65	66	63	59	55	53	51	47	41	0.052	0.069	23	
24	37	45	35-999	6	4	6	13	15	31	33	35	40	48	53	53	55	53	43	25	20	9	9	26	0.030	0.055	23	
25	38	40	34-999	20	14	3	32	49	54	57	62	64	66	67	69	70	69	59	49	41	41	43	41	0.047	0.070	23	
26	43	46	42-999	21	15	16	28	45	49	47	49	51	49	51	48	42	35	30	25	19	19	24	26	0.036	0.051	23	
27	28	28	23-999	13	15	2	7-999	999-999	999	54	41	68	77	78	74	70	69	64	58	54	53	55	0.047	0.078	20		
28	54	49	44-999	35	33	32	34	35	32	30	30	27	29	35	32	33	37	32	33	33	36	35	35	0.035	0.054	23	
29	31	37	39-999	39	37	37	44	44	45	43	44	44	41	42	42	46	47	48	49	50	54	53	46	0.044	0.054	23	
30	43	39	39-999	37	37	40	40	41	41	42	46	48	49	49	49	49	49	53	52	50	50	49	48	0.045	0.053	23	
AVG	38	37	35-999	28	25	23	27	35	41	46	50	53	56	58	59	59	57	51	45	41	39	39	38	0.042			
MAX	60	60	62-999	54	43	40	44	49	55	63	73	79	82	86	82	81	82	72	66	65	62	60	63		0.086		
DAYS	30	30	30	0	30	30	30	30	28	27	27	29	29	29	29	29	29	28	29	30	30	30	30			672	
STANDARD DEVIATION																									0.01656		

NOTE: -999 INDICATES INVALID DATA OR LESS THAN 75 PERCENT VALID DATA INCLUDED

ESCSYS AIR QUALITY MONITORING SYSTEM

( 1 HOUR RUNNING AVERAGES)

Validated Database

AIRS CODES

SITE .....WRALTOHR  
 PARAMETER ....03  
 MONTH .....Jun 99  
 UNITS .....PPM X (10 ^ 3)

TRANSACTION CODE: 1  
 STATE CODE: 37  
 INTERVAL CODE: 1

SITE CODE: 0017  
 COUNTY CODE: 183  
 UNITS CODE: 007

PARAMETER CODE: 44201  
 PARM OCC CODE: 1  
 METHOD CODE: 019

DAY	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	MAX	RDS		
1	37	39	36-999	20	20	24	27	37	39	40	42	46	53	59	60	59	59	58	53	50	44	43	43	0.043	0.060	23			
2	42	40	35-999	26	21	19	29	35	39	41	42	46	46	48	51	54	55	54	51	47	38	32	28	0.040	0.055	23			
3	26	24	24-999	19	17	17-999-999-999-999	52	54	58	67	72	78	83	76	61	49	45	42	32	0.047	0.083	19			0.047	0.083	19		
4	28	19	37-999	38	37	35	35	36	41	49	56	62	65	66	68	68	65	57	51	56	50	49	47	0.048	0.068	23			
5	46	44	39-999	33	24	20	39	47	58	65	70	72	68	68	66	64	64	63	52	38	38	40	37	0.050	0.072	23			
6	37	32	28-999	11	3	3	23	37	57	67	70	72	74	76	78	81	81	72	63	56	43	42	36	0.050	0.081	23			
7	25	22	18-999	10	6	10	19	37	43	60	72	73	71	72	75	82	84	79	59	50	47	36	31	0.047	0.084	23			
8	32	32	31-999	21	20	19	28	41	70	92	96	101	106	110	123	120	97	79	62	51	43	43	39	0.063	0.123	23			
9	42	43	44-999	29	24	25	31	24	79	84	89	91	102	104	95	94	81	63	48	36	24	17	28	0.056	0.104	23			
10	28	11	10-999	4	1	1	31	59	89	97	101	117	115	97	84	84	84	66	56	47	48	46	45	0.057	0.117	23			
11	45	42	40-999	24	35	36-999-999-999	39	41	48	54	58	59	56	51	46	37	35	45	45	37	0.044	0.059	20			0.044	0.059	20	
12	29	22	22-999	5	6	24	33	43	51	56	59	53	51	51	50	45	43	36	35	35	36	34	32	0.037	0.059	23			
13	32	27	23-999	21	20	21	23	22	27	40	48	48	47	54	63	60	49	41	33	32	21	21	21	0.035	0.063	23			
14	22	23	25-999	21	18	17	25	35	46	53	60	65	67	74	78	74	73	71	57	41	29	26	21	0.044	0.078	23			
15	18	15	11-999	5	6	18	21	27	34	35	36	34	40	40	32	33	35	33	28	25	27	25	29	0.026	0.040	23			
16	28	27	29-999	24	27	30	29	30	39	44	46	46	46	47	41	41	39	37	39	39	37	35	33	0.036	0.047	23			
17	38	44	44-999	38	37	36	34	33	32	32-999-999-999	43	42	44	44	40	25	12	7	6	19	0.033	0.044	20			0.033	0.044	20	
18	20	25	34-999	25	17	21	28	33	41	48	53	57	58	59	57	56	56	60	57	46	32	31	24	0.041	0.060	23			
19	29	17	21-999	26	28	38	49	58	61	61	60	60	57	57	57	54	55	54	52	49	47	45	41	0.047	0.061	23			
20	39	37	35-999	30	29	29	27	28	29	31	32	34	34	35	35	34	33	32	32	32	30	30	30	0.032	0.039	23			
21	31	30	29-999	23	21	19	19	21	21	26	30	30	32	31	32	31	38	37	36	32	31	31	29	0.029	0.038	23			
22	27	26	25-999	23	22	24	29	26	25	30	35	36	33	38	32	36	33	29	28	21	13	7	2	0.026	0.038	23			
23	2	1	0-999	23	4	24	25	37	46	52	54	53	54	58	60	60	55	51	36	24	15	4	0	0.032	0.060	23			
24	0	0	0-999	0	0	6-999-999	46	48	54	57	60	63	62	58	58	48	42	35	33	34	32	0.035	0.063	21			0.035	0.063	21
25	28	22	17-999	11	10	16	21	27	33	36	41	43	43	42	43	40	24	34	34	29	30	28	21	0.029	0.043	23			
26	15	15	15-999	7	7	13	16	23	36	44	49	46	44	46	48	49	47	33	27	33	22	24	20	0.030	0.049	23			
27	18	16	18-999	24	24	21	20	19	25	28	29	31	38	37	37	32	24	14	20	18	15	15	14	0.023	0.038	23			
28	12	12	13-999	11	10	8	6	10	15	17	24	31	36	42	46	52	53	53	50	45	38	30	25	0.028	0.053	23			
29	22	20	20-999	21	21	19	18	18	25	34	43	49	53	55	60	53	42	37	33	29	25	24	21	0.032	0.060	23			
30	18	17	15-999	14	12	12	12	17	22	26	34	36	36	44	47	43	40	38	37	35	34	33	32	0.028	0.047	23			
AVG	27	25	25-999	20	18	20	26	32	42	47	52	55	57	58	58	58	55	50	43	38	33	31	28	0.039					
MAX	46	44	44-999	38	37	38	49	59	89	97	101	117	115	110	123	120	97	79	63	56	50	49	47		0.123				
DAYS	30	30	30	0	30	30	30	27	27	28	29	29	29	29	30	30	30	30	30	30	30	30	30					678	

STANDARD DEVIATION 0.02061

NOTE: -999 INDICATES INVALID DATA OR LESS THAN 75 PERCENT VALID DATA INCLUDED

ESCSYS AIR QUALITY MONITORING SYSTEM

( 1 HOUR RUNNING AVERAGES)

Validated Database

AIRS CODES

SITE .....WRALTOWR  
 PARAMETER ....03  
 MONTH .....Jul 99  
 UNITS .....PPM X (10 ^ 3)

TRANSACTION CODE: 1  
 STATE CODE: 37  
 INTERVAL CODE: 1

SITE CODE: 0017  
 COUNTY CODE: 183  
 UNITS CODE: 007

PARAMETER CODE: 44201  
 PARM OCC CODE: 1  
 METHOD CODE: 019

DAY	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	MAX	RDS
1	30	28	28-999	24	26	22	20	22	26	34	36	42	48	53	55	54	48	44	33	24	13	13	12	0.032	0.055	23	
2	12	11	9-999	7	6	7	8	11	14	20	30	34	37	41	47	49	48	41	30	24	17	16	16	0.023	0.049	23	
3	15	13	11-999	9	11	11	13	20	27	32	39	41	42	46	51	52	50	41	27	30	28	23	19	0.028	0.052	23	
4	17	14	13-999	10	8	9	17	26	35	42	44	45	45	47	48	50	50	42	36	36	40	38	35	0.032	0.050	23	
5	32	29	26-999	21	18	17	23	39	64	84	75	77	80	87	95	96	78	49	59	57	41	32	30	0.053	0.096	23	
6	27	27	24-999	14	11	9	17	40	72	90	113	106	97	98	109	109	98	86	70	62	55	49	44	0.062	0.113	23	
7	38	35	33-999	27	22	21	27	37	47	58	67	73	75	78	78	74	70	60	54	53	50	37	27	0.050	0.078	23	
8	39	37	33-999	26	26-999-999-999	57	60	68	71	92	101	110	92	70	68	58	46	40	32	27	0.058	0.110	20				
9	23	21	18-999-999	12	14	33	51	63	79	83	78	74	77	76	68	66	58	49	49	55	49	44	0.052	0.083	22		
10	39	37	35-999	32	30	31	36	44	53	55	60	60	61	60	64	46	40	38	33	33	29	20	24	0.042	0.064	23	
11	28	31	25-999	29	38	40	33	26	23	23	24	32	35	35	34	32	30	24	20	14	12	16	12	0.027	0.040	23	
12	24	30	27-999	29	31	27	27	27	23	23	26	27	28	29	29	29	28	27	27	28	31	31	29	0.028	0.031	23	
13	30	32	30-999	23	22	21	20	20	22	23	21	21	21	20	20	18	17	16	16	16	21	26	24	0.022	0.032	23	
14	23	20	19-999	12	8	7	12	18	22	24	26	29	30	33	33	31	31	27	25	25	21	20	18	0.022	0.033	23	
15	17	16	13-999	11	9	11	17	19	17	21	30	34	42	43	42	42	32	35	24	10	21	1	1	0.022	0.043	23	
16	0	0	0-999	0	0	4	14	23	34	50	55	60	62	63	66	66	57	37	29	21	10	5	16	0.029	0.066	23	
17	13	10	8-999	16	20	24	28	32	42	57	65	71	69	68	69	70	71	64	51	47	33	26	29	0.043	0.071	23	
18	24	19	17-999	12	12	13	16	27	43	48	53	53	54	54	58	57	57	50	45	46	43	41	39	0.038	0.058	23	
19	25	20	19-999	21	18	16	21	34	54	67	80	75	74	68	72	76	73	61	38	47	44	49	48	0.048	0.080	23	
20	45	41	38-999	28	21	18	28	40	65	98	121	121	124	126	109	79	74	64	44	32	26	11	3	0.059	0.126	23	
21	2	0	4-999	0	0	1	11-999-999	63	61	63	74	77	72	70	65	57	49	52	45	33	15	0.039	0.077	21			
22	5	7	5-999	0	0	4	16	17	46	78	93	105	107	97	97	91	88	62	45	34	17	16	21	0.046	0.107	23	
23	26	28	26-999	17	6	5	19	43-999	70	83	72	87	80	98	71	51	52	35	28	16	3	7	0.042	0.098	22		
24	17	24	22-999	10	5	7	23	46	71	86	85	77	53	41	36	50	54	42	36	36	40	37	50	0.041	0.086	23	
25	53	42	35-999	33	36	31	28	31	43	60	72	81	85	92	92	80	65	47	35	30	30	28	29	0.050	0.092	23	
26	25	31	42-999	37	25	22	26	40	65	78	77	80	85	87	91	91	83	61	50	40	30	18	10	0.052	0.091	23	
27	3	2	1-999	0	0	1	5	14	26	48	94	124	124	102	71	80	94	74	62	45	33	24	19	0.045	0.124	23	
28	16	18	15-999	6	0	0	15-999	79	92	95	89	99	101	102	99	79	66	58	65	71	64	50	0.058	0.102	22		
29	34	34	30-999	16	14	17	32	43	54	74	85	85	77	74	76	73	76	72	65	55	49	43	32	0.053	0.085	23	
30	28	20	14-999	3	0	0	4	30	57	77	87	107	104	107	97	90	87	85	77	62	55	43	46	0.056	0.107	23	
31	41	36	27-999	30	25	18	37	61	75	82	82	91	102	100	104	103	93	81	68	58	48	55	58	0.064	0.104	23	
AVG	24	23	21-999	17	15	14	21	31	45	58	65	69	71	70	71	67	62	53	43	39	34	29	27	0.042			
MAX	53	42	42-999	37	38	40	37	61	79	98	121	124	124	126	110	109	98	86	77	65	71	64	58		0.126		
DAYS	31	31	31	0	30	31	30	30	28	29	31	31	31	31	31	31	31	31	31	31	31	31	31	31			705

STANDARD DEVIATION 0.02760

NOTE: -999 INDICATES INVALID DATA OR LESS THAN 75 PERCENT VALID DATA INCLUDED

ESCSYS AIR QUALITY MONITORING SYSTEM

( 1 HOUR RUNNING AVERAGES)

Validated Database

AIRS CODES

SITE .....WRALTOWR  
 PARAMETER ....03  
 MONTH .....Aug 99  
 UNITS .....PPM X (10 ^ 3)

TRANSACTION CODE: 1  
 STATE CODE: 37  
 INTERVAL CODE: 1

SITE CODE: 0017  
 COUNTY CODE: 183  
 UNITS CODE: 007

PARAMETER CODE: 44201  
 PARM OCC CODE: 1  
 METHOD CODE: 019

DAY	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	MAX	RDS
1	56	43	32-999	24	23	19	31	52	78	97	104	98	89	99	98	85	80	68	42	33	29	31	19	0.058	0.104	23	
2	16	29	37-999-999	29	28	33	41	50	59	64	64	66	69	68	66	63	60	51	41	30	20	17	0.046	0.069	22		
3	15	25	34-999	30	29	29	35	42	53	63	67	68	73	81	87	89	98	100	87	78	67	59	45	0.059	0.100	23	
4	45	42	41-999	35	28	24	30	52	62	67	75	78	81	86	89	92	90	81	67	58	52	43	39	0.059	0.092	23	
5	34	30	22-999	17	14	20	32	54	79	100	110	104	104	106	104	96	91	87	89	86	73	64	61	0.069	0.110	23	
6	56	46	37-999	33	25	22	40	56	76	89	89	97	105	110	113	110	108	82	55	38	21	19	29	0.063	0.113	23	
7	14	8	3-999	0	0	7	32	54	76	94	99	105	112	107	99	95	87	83	77	72	62	55	41	0.060	0.112	23	
8	33	26	23-999	19	21	22	27	34	43	60	70	84	85	83	85	84	78	77	78	77	69	64	59	0.057	0.085	23	
9	53	44	38-999	31	20	21	19	22	31	29	31	37	45	46	50	50	51	39	32	25	22	14	9	0.033	0.053	23	
10	9	7	2-999	0	0	0	15	38	52	66	75	84	90	85	84	83	80	70	59	58	59	56	53	0.049	0.090	23	
11	49	45	44-999	37	34	23-999-999-999	67	81	96	95	88	81	84	84	65	52	44	41	50	57	0.061	0.096	20				
12	57	45	39-999	34	28	18	24	42	54	85	104	119	127	121	118	109	80	71	68	57	45	33	33	0.066	0.127	23	
13	31	29	27-999	25	22	23	38	47	55-999	71	76	78	83	73	64	61-999	58	48	40	37	38	0.049	0.083	21			
14	39	38	37-999	35	33	31	34	47	45	54	61	70	80	84	61	45	50	50	54	50	47	46	41	0.049	0.084	23	
15	47	49	47-999	27	29	24	29	34	43	50	57	64	64	67	64	59	49	46	24	5	7	5	8	0.039	0.067	23	
16	11	4	11-999	12	11	10	24	38	49	58	61	64	66	70	64	72	68	53	36	23	22	23	13	0.038	0.072	23	
17	5	3	2-999	2	0	1	10	37	61	69	74	78	77	66	65	64	61	53	44	37	34	29	32	0.039	0.078	23	
18	33	35	35-999	30	25	20	26	40	67	95	116	118	120	112	115	117	101	78	58	38	19	13	12	0.062	0.120	23	
19	24	37	39-999	58	54	48	48	59	69	78	81	89	92	96	94	92	83	80	64	61	57	51	47	0.065	0.096	23	
20	46	38	37-999	19	16	28	33	36	35	35	50	47	47	51	62	66	64	43	30	17	2	1	7	0.035	0.066	23	
21	28	50	37-999	20	26	35	35	43	43	56	74	80	79	73	76	66	61	47	29	22	19	19	20	0.045	0.080	23	
22	27	13	5-999	1	1	15	25	33	48	60	63	64	68	70	69	53	42	41	33	30	25	19	26	0.036	0.070	23	
23	28	19	11-999	0	0	0	13	40	52	59	64	68	71	68	73	72	62	43	47	49	49	52	47	0.043	0.073	23	
24	38	31	24-999	7	4	11	23	32	39	46	48	51-999	53	57	56	48	40	34	41	38	34	31	0.036	0.057	22		
25	31	30	23-999	15-999	9-999-999	13	15	18	24	33	39	46	47	38	34	29	24	22	23	22	0.027	0.047	20				
26	21	20	20-999	19	19	41	36	30	30	29	46	51	54	52	41	24	36	34	27	21	20	12	11	0.030	0.054	23	
27	20	13	5-999	2	3	2	13	29	40	57	71	91	100	107	113	97	68	52	32	18	21	15	11	0.043	0.113	23	
28	3	3	4-999	1	0	1	7	49	70	84	84	87	90	91	91	83	68	50	31	22	15	13	7	0.041	0.091	23	
29	3	0	0-999	0	1	3	6	9	14	21	39	54	63	65	62	61	60	42	32	30	18	15	15	0.027	0.065	23	
30	14	17	40-999	39	34	27	26	27	28	30	34	40	45	48	49	47	44	37	32	27	23	19	17	0.032	0.049	23	
31	17	17	16-999	15	12	27	10	13	19	25	33	38	44	48	45	36	28	25	26	25	25	25	25	0.026	0.048	23	
AVG	29	27	25-999	20	18	19	26	39	49	60	68	74	78	78	77	73	67	58	48	40	35	31	29	0.046			
MAX	57	50	47-999	58	54	48	48	59	79	100	116	119	127	121	118	117	108	100	89	86	73	64	61		0.127		
DAYS	31	31	31	0	30	30	31	29	29	30	30	31	31	30	31	31	31	31	30	31	31	31	31	31			703

STANDARD DEVIATION 0.02820

NOTE: -999 INDICATES INVALID DATA OR LESS THAN 75 PERCENT VALID DATA INCLUDED





ESCSYS AIR QUALITY MONITORING SYSTEM

( 1 HOUR RUNNING AVERAGES)

Validated Database

AIRS CODES

SITE .....WRALTOWR  
 PARAMETER ....03  
 MONTH .....Oct 99  
 UNITS .....PPM X (10 ^ 3)

TRANSACTION CODE: 1  
 STATE CODE: 37  
 INTERVAL CODE: 1

SITE CODE: 0017  
 COUNTY CODE: 183  
 UNITS CODE: 007

PARAMETER CODE: 44201  
 PARM OCC CODE: 1  
 METHOD CODE: 019

DAY	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	MAX	RDS
1	0	0	0-999	0	0	0	0	3	9	16	35	45	49	55	56	58	55	39-999	10	2	3	3	2	0.020	0.058	22	
2	9	5	1-999	1	0	1	2	17	35	51	57	59	61	63	61	54	39	25	20	12	15	20	17	0.027	0.063	23	
3	20	10	8-999	2	6	3	9	24	22	25	40	43	44	39	41	29	27	10	5	8	12	11	9	0.019	0.044	23	
4	7	4	2-999	1	2	2	4	14	26	31	33	34	35	36	36	30	23	17	7	2	1	1	0	0.015	0.036	23	
5	1	1	3-999	2	6	8	10	19	17	25	33	40-999-999	32	34	29	21	23	23	18	9	1	0.017	0.040	21			
6	0	3	9-999	0	0	0	4	18	25	34	38	42	45	45	44	39	29	20	9	9	3	0	0	0.018	0.045	23	
7	1	0	0-999	0	0	0	2	8	23	37	48	52	59	56	53	51	33	12	13	27	31	33	33	0.025	0.059	23	
8	31	20	10-999	0	0	1	10	22	31	38	46	54	59	60	58	55	43	27	12	3	3	7	13	0.026	0.060	23	
9	12	11	12-999	13	9	3	5	30	39	44	47	49	48	44	42	33	25	7	24	32	32	30	27	0.027	0.049	23	
10	27	25	23-999	20	13	19	21	25	29	35	38	41	41	33	27	25	23	21	22	20	19	19	14	0.025	0.041	23	
11	13	9	6-999	2	2	3	3	3	6	20	25	20	18	22	24	22	16	20	21	17	17	18	22	0.014	0.025	23	
12	26	26	28-999	32	28	23	21	24	33	38	43	51	54	55	53	43	23	9	17	27	36	33	27	0.033	0.055	23	
13	17	19	22-999	20	15	11	8	8	14	18	15	14	54	21	24	24	16	8	21	25	26	27	27	0.020	0.054	23	
14	28	21	16-999	12	7	2	11-999	29	30	34	38	42	44	45	38	22	9	6	0	3	13	14	0.021	0.045	22		
15	13	5	1-999	0	0	0	6	14-999-999	37	42	44	48	47	41	20	2	1	5	14	17	18	0.018	0.048	21			
16	21	23	22-999	20	21	19	20	21	25	31	36	39	39	34	31	34	33	30	29	29	27	28	26	0.028	0.039	23	
17	25	22	20-999	17	15	13	11	11	12	14	17	17	18	17	16	15	16	18	16	17	17	18	19	0.017	0.025	23	
18	21	22	19-999	27	20	12	19	21	23	29	34	40	42	44	44	40	21	5	1	2	2	2	5	0.022	0.044	23	
19	4	8	5-999	0	0	1	4	12	21	29	35	40	41	36	31	23	11	1	3	0	2	2	4	0.014	0.041	23	
20	8	6	7-999	14	12	12	14	10	8	10	11	15	14	15	16	15	12	14	17	19	20	22	23	0.014	0.023	23	
21	21	21	18-999	11	10	6	5	9	11	21	24	31	35	38	38	32	13	1	0	0	0	0	0	0.015	0.038	23	
22	0	0	0-999	0	0	0	0	3	24	36	42	46	51	54	53	51	44	42	39	39	29	20	12	0.025	0.054	23	
23	7	2	2-999	6	5	6	12	17	23	26	31	31	31	29	29	28	23	13	7	4	4	4	4	0.015	0.031	23	
24	4	5	8-999	9	10	8	8	13	15	18	20	20	22	22	21	21	15	6	0	2	12	11	8	0.012	0.022	23	
25	6	4	0-999	0	0	0	0	4	9	15	17	21	24	25	28	26	18	14-999	9	6	4	2	0.011	0.028	22		
26	0	0	0-999	0	0	0	2-999-999-999	38	41	46	51	55	45	35	28	21	15	14	14	15	0.021	0.055	20				
27	15	11	8-999	2	1	0	3	9	15	27	52	57	62	61	56	47	29	3	1	0	2	7	11	0.021	0.062	23	
28	5	1	0-999	2	2	2	4	10	16	25	33	37	40	42	45	39	19	2	0	0	0	0	0	0.014	0.045	23	
29	0	0	0-999	0	0	0	0	1	13	30	30	48	57	63	60	48	11	1	1	1	0	0	0	0.016	0.063	23	
30	0	0	0-999	0	0	0	0	10	26	35	44	46	47	46	43	40	18	3	4	4	1	1	1	0.016	0.047	23	
31	1	0	0-999	0	0	0	0	15	30	38	40	42	43	43	43	39	27	18	7	2	0	0	0	0.017	0.043	23	
AVG	11	9	8-999	7	6	5	7	14	21	29	35	39	42	41	40	36	24	14	12	11	12	12	11	0.019			
MAX	31	26	28-999	32	28	23	21	30	39	51	57	59	62	63	61	55	44	42	39	39	36	33	33		0.063		
DAYS	31	31	31	0	31	31	31	31	29	29	29	31	31	30	30	31	31	31	30	30	31	31	31	31			703

STANDARD DEVIATION 0.01642

NOTE: -999 INDICATES INVALID DATA OR LESS THAN 75 PERCENT VALID DATA INCLUDED

ESCSYS AIR QUALITY MONITORING SYSTEM

( 1 HOUR RUNNING AVERAGES)

Validated Database

AIRS CODES

SITE .....WRALTOWR  
 PARAMETER ....M2  
 MONTH .....May 99  
 UNITS .....PPM X (10 ^ 3)

TRANSACTION CODE: 1  
 STATE CODE: 37  
 INTERVAL CODE: 1

SITE CODE: 0017  
 COUNTY CODE: 183  
 UNITS CODE: 007

PARAMETER CODE: 44201  
 PARM OCC CODE: 4  
 METHOD CODE: 019

DAY	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	MAX	ROS		
1	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	0		
2	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	0		
3	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	0		
4	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	0		
5	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	0		
6	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	0		
7	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	0		
8	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	0		
9	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	0		
10	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	0		
11	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	0		
12	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	0		
13	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	0		
14	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	0		
15	27	26	25	24	24	24	25	28	32	35	36	35	38	42	46	44	45	43	40	39	38	37	36	0.035	0.046	23			
16	35	34	34	36	33	31	30	31	32	34	36	39	40	39	39	42	41	40	39	37	35	33	32	28	0.033	0.038	23		
17	33	34	35	34	31	28	29	30	28	28	30	34	37	36	36	38	37	36	35	33	33	32	28	0.043	0.058	23			
18	30	29	34	32	28	26	28	36	41	42	44	45	48	52	55	55	56	58	57	55	46	46	43	0.036	0.059	23			
19	38	33	30	24	25	24	11	9	21	25	26	30	31	36	41	49	54	53	56	56	57	59	42	0.052	0.070	23			
20	38	39	37	38	40	36	35	44	47	52	56	62	66	73	81	84	86	89	93	91	85	85	78	74	70	49	0.071	0.093	23
21	64	63	62	61	62	60	50	36	62	66	73	81	84	86	89	93	91	85	85	78	74	70	49	0.058	0.075	23			
22	47	47	46	45	48	49	54	58	63	67	68	71	75	75	74	72	63	60	59	56	43	47	58	0.056	0.066	23			
23	55	51	51	51	50	47	46	47	51	61	65	64	65	64	65	66	66	65	59	57	48	43	46	0.050	0.073	23			
24	45	42	40	39	36	33	36	38	43	50	56	59	62	71	73	70	69	63	56	51	42	40	44	0.051	0.064	23			
25	47	47	40	39	38	37	23	34	48	54	57	58	59	59	56	56	64	62	58	60	61	56	59	0.037	0.064	19			
26	61	59	56	53	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	21		
27	15	27	40	40	34	29	29	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	23		
28	70	59	55	47	51	44	27	36	55	70	78	84	94	101	104	107	107	100	88	87	86	86	83	0.075	0.107	23			
29	86	75	75	74	82	84	70	61	80	89	78	94	93	94	95	95	96	95	100	93	75	74	75	0.084	0.100	23			
30	72	67	62	60	58	54	50	57	62	72	78	85	84	83	82	80	79	81	75	70	58	47	51	0.068	0.085	23			
31	50	48	48	45	44	41	31	46	53	56	57	58	63	72	69	66	63	61	56	47	44	43	42	0.052	0.072	23			
AVG	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	0.052		
MAX	86	75	75	74	82	84	70	61	80	89	78	94	94	101	104	107	107	100	100	93	86	86	83	0.107					
DAYS	17	17	17	17	0	17	17	16	16	15	16	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18		
STANDARD DEVIATION	0.01971																												

399

NOTE: -999 INDICATES INVALID DATA OR LESS THAN 75 PERCENT VALID DATA INCLUDED

ESCSYS AIR QUALITY MONITORING SYSTEM

( 1 HOUR RUNNING AVERAGES)

AIRS CODES

Validated Database

SITE .....WRALTOWR  
 PARAMETER ....M2  
 MONTH .....Jun 99  
 UNITS .....PPM X (10 ^ 3)

TRANSACTION CODE: 1  
 STATE CODE: 37  
 INTERVAL CODE: 1

SITE CODE: 0017  
 COUNTY CODE: 183  
 UNITS CODE: 007

PARAMETER CODE: 44201  
 PARM OCC CODE: 4  
 METHOD CODE: 019

DAY	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	MAX	RDS
1	46	47	47	43-999	41	38	33	42	44	44	45	50	57	64	65	65	65	66	64	58	51	49	48	0.051	0.066	23	
2	48	45	42	40-999	34	28	36	40	44	46	45	50	50	53	57	60	60	60	58	53	42	37	33	0.046	0.060	23	
3	31	29	30	29-999	24	23	31	43	51	53	58	59	62	71	77	85	90	85	76	71	69	66	52	0.055	0.090	23	
4	51	56	45	43-999	45	42	39	40	44	53	59	65	67	70	71	71	72	71	70	67	60	56	53	0.057	0.072	23	
5	52	51	49	47-999	45	42	43	49	61	69	73	74	71	70	69	69	71	72	67	62	58	51	50	0.059	0.074	23	
6	44	38	37	31-999	29	28	25	38	57	69	72	74	75	78	80	83	85	89	87	78	72	52	38	0.059	0.089	23	
7	29	28	26	25-999	18	18	23	38	46	62	76	76	74	75	79	85	90	89	82	82	71	54	39	0.056	0.090	23	
8	40	40	39	39-999	29	28	32	42	70	93	97	103	108	114	128	128	104	94	86	83	87	72	61	0.075	0.128	23	
9	59	59	59	56-999	46	38	32	52	80	87	90	92	103	107	99	97	94	92	97	97	89	79	76	0.075	0.121	20	
10	58	50	47	72-999	54	57-999-999-999	99	104	121	120	102	90	92	90	72	62	54	53	50	49	0.047	0.059	23				
11	48	45	44	43-999	39	41	39	35	38	41	42	48	53	57	59	58	54	50	45	53	55	52	50	0.044	0.059	23	
12	46	41	41	40-999	38	31	34	43	51	57	59	53	51	52	52	48	45	38	37	53	38	37	34	0.040	0.064	23	
13	32	27	24	22-999	23	24	24	23	28	38	46	49	44	52	64	63	62	53	48	47	52	36	31	0.048	0.078	23	
14	31	31	32	31-999	24	22	28	37	47	55	61	65	67	74	78	76	75	74	60	43	31	28	23	0.028	0.042	23	
15	19	16	12	10-999	8	22	24	26	34	34	37	36	42	40	33	35	37	36	33	29	28	27	29	0.038	0.050	23	
16	28	27	29	29-999	26	31	30	29	30	46	50	49	48	49	43	42	40	40	41	41	39	36	37	0.041	0.046	23	
17	40	45	45	44-999	40	39	37	36	35	34	39	41	44	45	43	45	46	45	46	45	41	37	32	0.049	0.066	22	
18	28	29	37	35-999	26	24	42-999	50	49	54	57	59	59	59	59	58	59	64	66	63	59	51	48	0.052	0.062	23	
19	45	43	41	39-999	41	43	50	59	62	62	61	62	59	59	60	57	57	57	55	52	49	47	41	0.033	0.039	23	
20	39	38	35	33-999	30	29	28	28	29	30	32	34	35	35	35	35	34	34	33	33	32	32	32	0.030	0.039	23	
21	32	32	31	29-999	24	21	21	22	21	26	30	30	32	32	33	32	39	39	37	34	34	33	30	0.034	0.039	21	
22	29	28	27	27-999	25	27	31-999-999	30	36	38	35	39	35	39	35	39	37	36	37	36	39	36	38	0.046	0.060	23	
23	36	35	33	33-999	30	27	26	37	46	53	54	52	54	57	60	60	59	56	55	52	49	44	39	0.045	0.063	23	
24	37	38	37	37-999	39	36	23	33	45	47	52	54	59	63	60	61	63	58	47	39	37	37	34	0.034	0.044	23	
25	30	26	25	25-999	22	23	25	28	33	36	41	43	44	44	44	44	41	40	38	32	32	32	26	0.036	0.052	23	
26	24	27	28	16-999	16	17	17	23	33	43	47	48	47	47	50	50	51	51	52	47	43	36	26	0.026	0.036	23	
27	23	22	22	24-999	26	23	22	21	25	28	29	31	36	35	36	34	31	26	24	22	19	18	16	0.029	0.056	23	
28	14	13	15	14-999	11	9	8	11	16	19	24	32	35	41	47	53	56	56	53	48	40	32	27	0.034	0.060	23	
29	24	21	22	22-999	22	20	20	21	27	35	44	48	51	54	60	56	45	40	35	30	26	26	23	0.031	0.051	23	
30	20	18	16	16-999	13	13	13	18	24	27	34	38	40	46	51	50	45	44	39	37	35	34	32	0.046			
AVG	36	35	34	33-999	30	29	29	34	42	49	53	56	57	59	61	61	60	58	54	51	48	42	38	0.046			
MAX	59	59	59	72-999	54	57	50	59	80	99	104	121	120	114	128	128	104	94	97	97	89	79	76		0.128		
DAYS	30	30	30	30	0	30	30	29	27	28	30	30	30	30	30	30	30	30	30	30	30	30	30	30			684

STANDARD DEVIATION 0.01997

NOTE: -999 INDICATES INVALID DATA OR LESS THAN 75 PERCENT VALID DATA INCLUDED

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 ESCSYS AIR QUALITY MONITORING SYSTEM  
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( 1 HOUR RUNNING AVERAGES)

AIRS CODES

Validated Database

SITE .....WRALTOWR  
 PARAMETER ....M2  
 MONTH .....Jul 99  
 UNITS .....PPM X (10 ^ 3)

TRANSACTION CODE: 1  
 STATE CODE: 37  
 INTERVAL CODE: 1

SITE CODE: 0017  
 COUNTY CODE: 183  
 UNITS CODE: 007

PARAMETER CODE: 44201  
 PARK OCC CODE: 4  
 METHOD CODE: 019

DAY	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	MAX	RDS
1	30	29	29	26-999	28	25	22	25	29	35	37	42	49	53	55	55	49	44	34	27	24	20	18	0.034	0.055	23	
2	17	14	14	13-999	10	10	9	13	14	20	30	34	38	41	48	49	50	49	41	27	22	19	19	0.026	0.050	23	
3	19	16	14	12-999	13	13	15	21	28	33	37	39	40	43	49	51	51	48	43	41	31	25	22	0.031	0.051	23	
4	20	18	17	15-999	12	12	18	28	37	43	45	45	44	46	47	50	51	46	42	43	45	42	39	0.035	0.051	23	
5	36	33	30	28-999	23	21	25	39	64	83	71	71	74	81	91	102	96	83	90	70	66	75	65	0.062	0.102	23	
6	54	46	44	42-999	33	30-999-999-999	84	107	104	100	105	107	111	100	89	74	67	58	53	48	0.073	0.111	20				
7	41	39	37	35-999	25	25	30	39	49	60	68	73	74	78	79	78	74	66	59	58	53	34	30	0.052	0.079	23	
8	42	42	37	32-999	33	35	40	47	59	62	68	74	90	97	106	91	73	71	60	50	42	39	40	0.058	0.106	23	
9	38	27	26	28-999	25	25	37	54	66	82	85	78	73	76	75	68	67	60	52	55	59	53	47	0.055	0.085	23	
10	44	42	39	37-999	34	35	39	48	54	57	60	59	60	62	67	57	52	49	45	45	47	48	44	0.049	0.067	23	
11	46	44	41	35-999	41	42	35	28	24	24	24	32	37	37	37	35	32	31	28	22	19	21	17	0.032	0.046	23	
12	28	32	29	28-999	34	33	30	29	27	28	28	29	30	30	31	31	30	29	29	30	33	33	32	0.030	0.034	23	
13	32	34	33	27-999	26	25	25	24	24	24	22	22	23	22	22	21	21	21	20	21	25	28	27	0.025	0.034	23	
14	25	23	21	19-999	14	12	17	20	23	25	27	30	32	34	35	33	33	32	30	29	26	23	22	0.025	0.035	23	
15	20	21	17	18-999	15	15	18	19	17	21	30	34	41	41	40	42	43	46	42	36	26	32	24	0.029	0.046	23	
16	20	18	16	19-999	14	15	19	24	34	48	56	57	60	61	65	66	69	65	59	50	48	31	28	0.041	0.069	23	
17	28	29	26	23-999	25	24	26	32	41	57	66	71	70	69	71	73	75	77	73	56	35	30	34	0.048	0.077	23	
18	27	25	25	23-999	23	21	24	31	46	52	57	56	56	56	59	58	60	55	52	53	51	48	46	0.044	0.060	23	
19	43	39	34	30-999	22	19	22	34	56	69	82	77	75	68	72	78	78	73	69	59	56	57	55	0.055	0.082	23	
20	51	48	45	40-999	29	28-999-999	63	95	117	118	122	122	115	101	84	78	74	76	71	41	40	0.074	0.122	21			
21	50	49	45	37-999	20	22	10	38	54	62	60	61	72	75	72	71	67	63	59	56	46	41	36	0.051	0.075	23	
22	32	33	28	28-999	24	15	15	14	45	78	91	103	104	96	98	97	92	88	81	78	77	75	72	0.064	0.104	23	
23	74	66	60	49-999	29	14	24	48	67	76	82	83	86	93	102	99	104	85	77	84	83	82	82	0.072	0.104	23	
24	75	63	69	76-999	41	59	35	46	69	85	85	82	73	71	66	66	67	58	50	53	43	39	53	0.062	0.085	23	
25	58	51	42	36-999	40	36	33	34	45	61	71	80	83	90	95	88	74	70	70	76	67	59	56	0.062	0.095	23	
26	53	52	53	50-999	37	34	29	41	66	82	80	80	85	87	93	92	87	82	82	74	77	73	66	0.068	0.093	23	
27	60	64	63	64-999	54	50	27	13	22	42	92	123	124	111	95	118	114	95	84	86	77	67	83	0.075	0.124	23	
28	76	78	75	58-999	48	57	33	45-999-999	92	86	95	99	101	101	96	86	85	77	78	72	61	0.075	0.101	21			
29	58	56	47	44-999	33	32	39	44	54	74	86	87	80	77	76	75	80	78	72	63	57	53	47	0.061	0.087	23	
30	46	44	46	48-999	58	59	51	32	60	80	88	100	102	105	95	89	92	90	84	85	82	76	72	0.074	0.108	23	
31	63	53	49	47-999	44	44	47	63	74	78	80	89	98	95	98	101	97	87	83	86	83	80	76	0.075	0.101	23	
AVG	42	40	37	34-999	29	29	27	34	45	57	65	69	71	72	73	72	70	64	59	56	52	47	45	0.052			
MAX	76	78	75	76-999	58	59	51	63	74	95	117	123	124	122	115	118	114	95	90	86	83	82	83		0.124		
DAYS	31	31	31	31	0	31	31	29	29	29	30	31	31	31	31	31	31	31	31	31	31	31	31	31			706

STANDARD DEVIATION 0.02553

ESCSYS AIR QUALITY MONITORING SYSTEM

( 1 HOUR RUNNING AVERAGES)

Validated Database

AIRS CODES

SITE .....WRALTOWR  
 PARAMETER ....N2  
 MONTH .....Aug 99  
 UNITS .....PPM X (10 ^ 3)

TRANSACTION CODE: 1  
 STATE CODE: 37  
 INTERVAL CODE: 1

SITE CODE: 0017  
 COUNTY CODE: 183  
 UNITS CODE: 007

PARAMETER CODE: 44201  
 PARM OCC CODE: 4  
 METHOD CODE: 019

DAY	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	MAX	RDS
1	71	68	65	61-999	55	50	50	59	79	96	101	95	85	93	97	86	84	81	82	70	61	61	57	0.074	0.101	23	
2	56	50	46	47-999	36	32	35	42	51	59	63	63	65	68	67	66	65	64	60	57	58	61	61	0.055	0.068	23	
3	56	50	47	42-999	40	38	38	43	54	63	67	67	73	80	87	90	101	105	95	85	72	65	57	0.066	0.105	23	
4	52	50	48	47-999	34	30	34	53	63	68	74	78	80	84	87	91	91	88	78	61	60	56	53	0.063	0.091	23	
5	48	44	45	45-999	43	41	38	55	80	101	109	103	102	108	105	97	94	95	97	93	79	69	66	0.076	0.109	23	
6	60	57	58	63-999	63	40	43	56	76	86	86	93	101	106	111	111	113	101	92	92	81	76	70	0.080	0.113	23	
7	64	61	63	60-999	63	54	40	52	71	91	96	101	109	105	100	95	90	87	82	76	66	57	41	0.075	0.109	23	
8	33	26	23	20-999	22	24	29	35	43	59	67	80	81	79	81	82	82	87	92	81	71	67	67	0.058	0.092	23	
9	66	60	53	55-999	54	32	21	26	32	30	32	38	45	46	49	50	52	53	49	49	45	46	44	0.045	0.066	23	
10	41	45	33	30-999	26	28	23	40	53	66	74	82	88	84	82	83	81	76	71	65	64	60	57	0.059	0.088	23	
11	53	51	51	46-999	35	32	33	43-999-999	78	94	93	86	81	84	87	84	82	83	62	55	61			0.065	0.094	21	
12	62	61	54	45-999	43	39	27	40	49	79	99	109	121	117	116	108	79	75	73	67	53	47	44	0.070	0.121	23	
13	41	35	30	29-999	26	27	36	47	55	77	68	73	73	78	73	63	61-999	60	49	41	38	39		0.051	0.078	22	
14	38	38	38	37-999	35	32	35-999	47	54	59	66	76	80	64	57	55	58	56	53	52	50	52		0.051	0.080	22	
15	58	59	54	51-999	41	39	34	33	40	48	56	62	63	63	64	63	62	61	59	63	61	48	41	0.053	0.064	23	
16	46	40	26	26-999	25	24	27	39	49	55	59	63	64	70-999	72	72	71	73	66	48	48	51		0.051	0.073	22	
17	47	39	40	34-999	27	29	29	38	62	71	75	78	78	75	71	67	63	58	57	56	52	52	42	0.054	0.078	23	
18	41	42	40	39-999	33	29	31	44	67	92	115	118	118	111	114	119	122	114	107	121	122	86	50	0.082	0.122	23	
19	65	60	49	56-999	64	55	50	59	68	78	81	87	90	92	94	93	90	86	68	66	64	65	64	0.071	0.094	23	
20	62	57	43	39-999	37	33	38	38	37	34	50	50	54	57	63	66	66	68	69	73	51	35	47	0.051	0.073	23	
21	50	61	62	68-999	54	38	36	45	43	56	75	80	78	75	77	76	70	69	68	68	62	60	56	0.062	0.080	23	
22	50	43	42	41-999	38	30	27	34	46	58	61	64	66	68	68	70	68	68	72	65	63	64	48	0.055	0.072	23	
23	40	42	42	43-999	40	47	30	42	51	59	65	68	71	71	73	74	65	50	54	54	54	55	53	0.054	0.074	23	
24	51	40	37	31-999	42	37	32	36	41	48	49	51-999	54	56	57	52	48	43	43	41	39	36		0.044	0.057	22	
25	35	33	28	23-999-999	11	13	13-999-999	18	24	30	39	43	46	39	37	31	25	24	25	24				0.028	0.046	20	
26	22	21	22	22-999	21	45	48	32	32	37	46	51	53	53	45	46	41	36	31	28	27	24	22	0.035	0.053	23	
27	24	24	27	28-999	21	22	14	27	38	54	69	87	94	103	109	111	103	99	82	78	43	29	30	0.057	0.111	23	
28	33	40	46	68-999	55	45	23	49	69	81	80	82	84	86	88	87	85	85	86	75	46	41	29	0.064	0.088	23	
29	18	14	13	15-999	12	11	12	11	14	21	38	54	61	65	64	65	66	45	39	34	21	17	17	0.032	0.066	23	
30	16	19	41	42-999	36	28	27	28	28	30	34	40	46	49	51	50	46	40	34	29	25	21	20	0.034	0.051	23	
31	20	19	18	18-999	16-999	13	15	20	26	33	39	44	48	49	39	31	28	28	28	28	28	28	29	0.028	0.049	22	
AVG	46	44	41	41-999	38	34	31	39	50	61	67	72	76	77	78	76	73	71	67	63	55	50	46	0.056			
MAX	71	68	65	68-999	64	55	50	59	80	101	115	118	121	117	116	119	122	114	107	121	122	86	70		0.122		
DAYS	31	31	31	31	0	30	30	31	30	29	29	31	31	30	31	30	31	31	30	31	31	31	31				703

STANDARD DEVIATION 0.02378

NOTE: -999 INDICATES INVALID DATA OR LESS THAN 75 PERCENT VALID DATA INCLUDED



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 ESCSYS AIR QUALITY MONITORING SYSTEM  
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( 1 HOUR RUNNING AVERAGES)

Validated Database

AIRS CODES

SITE .....WRALTOWR	TRANSACTION CODE: 1	SITE CODE: 0017	PARAMETER CODE: 44201
PARAMETER ....M4	STATE CODE: 37	COUNTY CODE: 183	PARM OCC CODE: 5
MONTH .....May 99	INTERVAL CODE: 1	UNITS CODE: 007	METHOD CODE: 019
UNITS .....PPM X (10 ^ 3)			

DAY	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	MAX	RDS
1	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	0
2	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	0
3	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	0
4	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	0
5	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	0
6	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	0
7	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	0
8	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	0
9	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	0
10	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	0
11	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	0
12	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	0
13	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	0
14	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	40	36	32	31	31	29	29	30	30	30	31	-999	0.040	0.040	11
15	32	31	30	29	29	-999	28	29	31	36	40	41	43	48	53	51	52	53	50	47	45	44	42	41	0.040	0.053	23
16	40	39	40	38	38	-999	35	35	36	36	39	42	44	45	45	45	48	48	46	45	44	42	40	39	0.041	0.048	23
17	44	42	43	43	41	-999	36	36	37	35	32	34	38	42	41	41	44	43	42	42	41	45	46	43	0.040	0.046	23
18	44	42	48	48	35	-999	43	36	41	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	8
19	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	0
20	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	0
21	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	0
22	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	0
23	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	0
24	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	0
25	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	0
26	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	0
27	-999	-999	-999	-999	-999	-999	-999	-999	-999	48	53	55	61	64	67	70	70	70	73	74	75	74	73	70	-999	0.075	15
28	70	62	56	57	58	-999	57	40	37	54	68	76	82	93	99	102	105	106	99	89	88	87	85	85	0.076	0.106	23
29	85	82	79	82	80	-999	82	84	66	78	88	76	93	92	93	94	94	96	95	101	95	77	77	77	0.085	0.101	23
30	73	68	66	62	60	-999	58	55	58	62	71	77	84	84	82	81	80	79	82	78	71	58	49	52	0.069	0.084	23
31	51	50	47	48	49	-999	45	40	47	53	56	57	58	63	72	69	66	63	61	56	49	46	43	43	0.054	0.072	23
AVG	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	-999	0.057
MAX	85	82	79	82	80	-999	82	84	66	78	88	77	93	93	99	102	105	106	99	101	95	87	85	85		0.106	
DAYS	8	8	8	8	8	0	8	8	8	8	8	8	8	9	9	9	9	9	9	9	9	9	9	9	9	9	195

STANDARD DEVIATION 0.02015

NOTE: -999 INDICATES INVALID DATA OR LESS THAN 75 PERCENT VALID DATA INCLUDED

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 ESCSYS AIR QUALITY MONITORING SYSTEM  
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( 1 HOUR RUNNING AVERAGES)

Validated Database

AIRS CODES

SITE .....WRALTOWR  
 PARAMETER ....M4  
 MONTH .....Jun 99  
 UNITS .....PPM X (10 ^ 3)

TRANSACTION CODE: 1  
 STATE CODE: 37  
 INTERVAL CODE: 1

SITE CODE: 0017  
 COUNTY CODE: 183  
 UNITS CODE: 007

PARAMETER CODE: 44201  
 PARM OCC CODE: 5  
 METHOD CODE: 019

DAY	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	MAX	RDS
1	48	50	51	50	48-999	47	39	42	44	44	45	50	57	64	64	65	64	67	67	59	51	49	48	0.053	0.067	23	
2	47	45	44	43	41-999	37	37	40	44	46	45	51	51	53	57	60	60	60	58	54	42	37	33	0.047	0.060	23	
3	31	29	30	29	28-999	24	32	44	51	53	59	59	63	71	77	85	89	85	77	72	68	61	59	0.055	0.089	23	
4	55	58	48	48	48-999	43	41	41	45	53	60	65	68	69	70	71	72	73	72	67	61	56	53	0.058	0.073	23	
5	53	53	53	55	56-999	53	47	50	61	69	74	75	71	70	70	69	71	72	67	63	61	57	53	0.062	0.075	23	
6	45	45	47	44	44-999	45	30	37	57	70	72	75	74	78	80	83	84	90	88	80	76	48	36	0.062	0.090	23	
7	32	31	29	30	30-999	24	25	37	47	63	77	77	75	75	78	85	90	89	82	82	78	60	43	0.058	0.090	23	
8	43	43	44	43	42-999	36	40	44	70	94	96	102	107	113	126	126	104	94	87	87	90	82	65	0.077	0.126	23	
9	63	62	63	61	62-999	61	54	57	83	88	90	91	101	107	99	98	95	96	99	97	90	90	84	0.082	0.107	23	
10	59	54	78	61	81-999	56	58	56-999-999	104	122	120	103	91	93	91	72	62	56	54	50	48			0.075	0.122	21	
11	48	45	44	43	81-999	41	40	36	38	42	42	48	52	57	58	56	53	49	47	56	56	53	48	0.049	0.081	23	
12	44	41	41	41	40-999	34	34	42	51	56	59	53	50	51	51	47	45	40	40	56	41	39	36	0.045	0.059	23	
13	30	22	22	18	26-999	22	21	21	26	36	45	49	45	51	61	63	62	53	55	59	55	43	34	0.040	0.063	23	
14	37	36	35	34	31-999	26	28	37	48	55	62	65	67	74	78	76	75	74	59	42	31	27	22	0.049	0.078	23	
15	18	13	12	11	6-999	40	38	29	35	35	39	39	46	43	34	37	38	40	37	34	32	31	31	0.031	0.046	23	
16	30	28	27	30	32-999	37	37	35	45	49	53	51	49	50	46	46	44	42	44	42	41	38	40	0.041	0.053	23	
17	43	47	46	47	45-999	41	40	39	37	37	39	38	41	42	42	45	45	46	48	46	43	42	44	0.043	0.048	23	
18	39	34	39	36	32-999	25	30	35	40-999	55	57	59	59	59	58	60	66	67	67	63	55	50		0.049	0.067	22	
19	47	51	52	60	54-999	48	51	59	62	62	61	62	60	60	61	58	58	57	55	51	49	47	44	0.055	0.062	23	
20	42	40	37	35	33-999	30	30	30	31	32	34	36	37	37	38	37	36	36	35	35	34	34	34	0.035	0.042	23	
21	34	34	32	30	28-999	22	22	23	23	26	29	30	32	32	33	33	40	40	39	36	35	33	31	0.031	0.040	23	
22	30	30	28	28	27-999	28	32	29	29-999	34	36	35	38	36	40	37	38	40	40	46	50	48		0.035	0.050	22	
23	40	42	40	38	27-999	28	30	35	46	52	54	52	54	57	60	60	60	56	57	53	50	48	47	0.047	0.060	23	
24	47	46	44	44	45-999	42	34	32	46	47	52	55	59	63	60	60	62	57	47	39	37	39	33	0.047	0.063	23	
25	29	26	28	31	31-999	37	34	30	33	36	41	44	45	46	45	45	43	41	40	34	32	30	27	0.036	0.046	23	
26	26	35	35	25	28-999	19	16	22	32	43	48	48	46	48	50	50	52	53	53	49	48	36	26	0.039	0.053	23	
27	22	23	22	23	25-999	21	22	22	26	28	29	31	36	35	37	35	31	26	25	22	19	17	15	0.026	0.037	23	
28	13	13	15	14	12-999	8	9	12	16	19	24	33	35	41	48	53	56	56	53	48	39	32	28	0.029	0.056	23	
29	25	21	23	23	24-999	20	21	21	27	36	44	49	52	55	62	57	46	41	37	29	27	28	25	0.034	0.062	23	
30	23	21	18	16	15-999	16	14	20	24	28	36	40	42	48	52	52	50	47	39	37	35	34	32	0.032	0.052	23	
AVG	38	37	38	36	37-999	34	33	35	42	48	53	56	58	60	61	61	60	59	56	53	49	45	41	0.047			
MAX	63	62	78	61	81-999	61	58	59	83	94	104	122	120	113	126	126	104	96	99	97	90	90	84		0.126		
DAYS	30	30	30	30	30	0	30	30	30	29	27	30	30	30	30	30	30	30	30	30	30	30	30			686	

STANDARD DEVIATION 0.01960

NOTE: -999 INDICATES INVALID DATA OR LESS THAN 75 PERCENT VALID DATA INCLUDED



ESCSYS AIR QUALITY MONITORING SYSTEM

( 1 HOUR RUNNING AVERAGES)

Validated Database

AIRS CODES

SITE .....WRALTOWR  
 PARAMETER ....M4  
 MONTH .....Jul 99  
 UNITS .....PPM X (10 ^ 3)

TRANSACTION CODE: 1  
 STATE CODE: 37  
 INTERVAL CODE: 1

SITE CODE: 0017  
 COUNTY CODE: 183  
 UNITS CODE: 007

PARAMETER CODE: 44201  
 PARN OCC CODE: 5  
 METHOD CODE: 019

DAY	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	MAX	RDS
1	30	28	28	27	28-999	27	24	26	30	37	39	45	52	56	58	57	50	47	36	28	24	21	20	0.036	0.058	23	
2	19	16	18	16	14-999	12	10	14	15	22	32	36	39	43	50	51	51	50	43	28	22	20	20	0.028	0.051	23	
3	20	19	14	12	14-999	14	16	22	29	34	39	41	41	45	50	52	52	49	46	43	31	25	22	0.032	0.052	23	
4	21	20	19	17	16-999	15	19	29	38	43	46	46	45	47	48	51	51	47	43	45	46	42	39	0.036	0.051	23	
5	36	33	30	27	25-999	21	25	39	62	81	70	71	74	80	90	100	94	86	93	71	71	74	71	0.062	0.100	23	
6	59	52	51	70	55-999	36	26	35-999-999	106	106	100	105	108	111	101	89	74	67	59	53	48			0.072	0.111	21	
7	40	39	38	36	33-999	25	30	38	48	60	68	73	74	77	78	78	74	66	62	60	49	29	30	0.052	0.078	23	
8	41	43	48	49	40-999	41	40	47	58	61	67	72	88	95	104	91	72	70	58	48	42	45	49	0.060	0.104	23	
9	42	29	33	35-999-999	37	40	54	65	82	85	78	73	76	75	68	66	60	52	56	58	51	46		0.057	0.085	22	
10	43	41	39	37	36-999	34	39	47	54	57	60	59	60	61	68	63	63	52	48	48	61	51	48	0.050	0.068	23	
11	54	51	43	35	36-999	42	36	30	25	25	25	33	38	37	38	36	32	32	30	27	24	29	21	0.034	0.054	23	
12	32	36	33	31	33-999	35	33	33	31	31	31	31	32	33	33	33	33	31	31	32	35	35	34	0.033	0.036	23	
13	34	35	35	28	27-999	27	27	27	26	26	25	24	25	25	25	24	24	24	23	24	28	31	28	0.027	0.035	23	
14	27	24	22	19	17-999	14	19	21	25	27	28	30	31	32	34	33	32	33	32	32	30	25	24	0.027	0.034	23	
15	23	24	19	21	17-999	15	16	17	16	19	27	31	38	39	37	40	41	46	46	42	30	35	29	0.029	0.046	23	
16	32	34	31	26	25-999	26	23	22	32	46	55	55	58	59	68	64	68	63	58	52	50	36	34	0.044	0.068	23	
17	32	34	26	27	26-999	22	23	29	39	56	65	69	70	68	70	72	74	78	78	58	33	29	38	0.049	0.078	23	
18	30	27	28	27	27-999	30	31	33	46	51	56	56	56	56	59	58	60	56	54	57	55	52	48	0.046	0.060	23	
19	44	40	34	32	28-999	20	22	33	55	68	81	76	74	67	71	78	79	74	72	63	59	59	56	0.056	0.081	23	
20	52	49	46	41	36-999	36	34	37-999	93	114	115	119	119	114	103	84	77	74	74	61	47	46		0.071	0.119	22	
21	43	49	53	38	26-999	22	16	34	52	62	60	61	71	73	71	71	68	64	62	59	49	32	39	0.051	0.073	23	
22	34	28	28	23	23-999	20	15	12	41	74	89	100	102	93	96	96	91	88	81	78	76	86	90	0.064	0.102	23	
23	88	66	49	41	37-999	34	34	49	67	76	81	81	84	92	101	98	103	86	83	87	82	85	87	0.074	0.103	23	
24	86	78	86	93	85-999	77	69	54	70	83	84	82	78	75	68	67	67	60	55	59	48	42	60	0.071	0.093	23	
25	68	65	50	40	41-999	36	32	33	43	57	67	77	78	86	93	88	74	70	73	78	65	60	58	0.062	0.093	23	
26	56	54	54	52	50-999	42	33	41	64	80	78	79	83	86	91	90	86	84	80	75	83	82	72	0.069	0.091	23	
27	69	73	78	75	81-999	76	78	46	21	42	91	121	123	109	95	115	122	112	91	90	80	79	84	0.085	0.123	23	
28	83	72	78	74	81-999	77	76	51	72	89	93	88	95	99	101	101	98	92	93	83	92	88	69	0.085	0.101	23	
29	59	63	62	56	53-999	50-999-999	52	72	84	86	80	77	76	75	80	79	71	63	60	54	52			0.067	0.086	21	
30	52	52	57	60	61-999	65	71	57	60	79	87	107	102	103	94	87	92	90	84	86	81	74	65	0.077	0.107	23	
31	58	51	50	54	59-999	59	57	64	73	77	79	88	97	95	98	100	97	88	90	90	88	82	77	0.077	0.100	23	
AVG	45	43	41	39	38-999	35	34	36	45	57	65	68	70	71	73	73	70	66	62	58	54	50	49	0.054			
MAX	88	78	86	93	85-999	77	78	64	73	93	114	121	123	119	114	115	122	112	93	90	92	88	90		0.123		
DAYS	31	31	31	31	30	0	31	30	30	29	30	31	31	31	31	31	31	31	31	31	31	31	31	31			707

STANDARD DEVIATION 0.02504

NOTE: -999 INDICATES INVALID DATA OR LESS THAN 75 PERCENT VALID DATA INCLUDED

ESCSYS AIR QUALITY MONITORING SYSTEM

( 1 HOUR RUNNING AVERAGES)

Validated Database

AIRS CODES

SITE .....WRALTQWR  
 PARAMETER ....M4  
 MONTH .....Aug 99  
 UNITS .....PPM X (10 ^ 3)

TRANSACTION CODE: 1  
 STATE CODE: 37  
 INTERVAL CODE: 1

SITE CODE: 0017  
 COUNTY CODE: 183  
 UNITS CODE: 007

PARAMETER CODE: 44201  
 PARM OCC CODE: 5  
 METHOD CODE: 019

DAY	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	MAX	RDS
1	70	68	61	58	64-999	60	59	60	77	94	99	93	83	91	95	85	84	85	82	72	61	61	58	0.075	0.099	23	
2	56	52	55	44-999-999	34	36	43	51	60	64	62	65	67	67	66	65	64	60	59	61	65	67	0.057	0.067	22		
3	62	57	47	43	44-999	38	38	43	53	63	67	67	72	79	87	90	101	105	96	85	72	63	56	0.066	0.105	23	
4	51	51	54	50	48-999	39	39	53	62	68	74	77	79	83	87	90	91	88	78	62	66	60	60	0.066	0.091	23	
5	56	54	56	50	50-999	53	42	55	78	99	107	101	100	106	103	95	94	99	98	95	80	70	66	0.079	0.107	23	
6	59	57	62	66	66-999	48	47	57	75	84	85	89	99	105	109	109	111	103	95	96	82	78	71	0.081	0.111	23	
7	67	73	77	73	69-999	75	61	56	69	91	96	101	108	104	99	94	92	87	82	78	65	56	38	0.079	0.108	23	
8	29	23	19	21	25-999	28	31	35	43	58	66	79	80	77	80	80	81	88	92	78	70	66	66	0.057	0.092	23	
9	64	62	55	58	57-999	44	33	28	38	35	35	40	45	46	48	50	51	52	51	54	50	54	52	0.048	0.064	23	
10	49	42	43	48	50-999	38	35	41	54	67	75	82	89	85	83	83	82	76	72	67	65	60	57	0.063	0.089	23	
11	53	53	54	47	45-999	53	38	42	52	64	77	93	91	84	79	82	86	84	88	87	68	58	63	0.067	0.093	23	
12	64	63	54	52	57-999	49-999-999	44	74	94	106	118	114	113	106	79	75	73	67	59	50	48	0.074	0.118	21			
13	42	34	34	35	35-999	36	38	46	54	60	67	73	73	78	73	63	61-999	59	49	39	36	36	0.051	0.078	22		
14	35	36	35	35	34-999	32	37-999	47	54	59	66	76	80	67	64	58	60	56	54	55	54	60	0.052	0.080	22		
15	72	68	58	56	53-999	39	38	32	38	46	55	60	60	61	63	61	62	63	64	63	60	51	49	0.055	0.072	23	
16	43	50	45	44	40-999	31	33	41	49	54	59	63	64	69-999	71	72	74	76	69	54	59	57	0.055	0.076	22		
17	51	51	55	50	41-999	47	50	42	62	70	75	78	78	77	78	76	69	78	85	73	72	61	48	0.064	0.085	23	
18	46	45	43	41	39-999	35	35	45	65	89	114	117	117	110	112	118	121	115	115	125	131	114	62	0.085	0.131	23	
19	64	58	55	64	72-999	58	52	58	69	77	80	85	89	90	92	92	91	88	67	67	65	67	68	0.073	0.092	23	
20	66	62	56	54	55-999	35	42	41	38	39	49	55	63	62	63	65	66	67	69	70	68	55	58	0.056	0.070	23	
21	52	67	65	69	59-999	58	58	47	41	54	71	76	77	75	76	76	73	71	71	71	68	66	61	0.065	0.077	23	
22	59	57	52	48	56-999	44	44	37	45	56	59	62	65	67	68	69	68	68	71	66	63	63	55	0.058	0.071	23	
23	51	54	54	51	50-999	64	56	43	51	59	65	69	71	72	74	75	66	55	56	56	56	57	55	0.059	0.075	23	
24	54	54	53	53	60-999	57	43	39	42	49	49	52-999	54	57	58	53	50	47	44	42	42	40	0.050	0.060	22		
25	39	36	29	26	23-999	15	16	14	14	17	17	23	30	38	42	45	40	38	31	26	24	23	22	0.027	0.045	23	
26	19	19	21	20	20-999	46-999-999	32	37	46	51	52	54	45	45	43	40	32	26	26	25	23	0.034	0.054	21			
27	25	27	34	31	30-999	29	19	26	35	51	66	84	92	101	107	110	104	99	85	84	40	30	35	0.058	0.110	23	
28	41	64	69	73	52-999	44	48	63	67	81	80	81	83	85	87	86	85	85	86	79	70	50	34	0.069	0.087	23	
29	31	16	13	12	10-999	15	19	16	15	21	39	55	63	66	66	68	69	47	41	34	20	17	16	0.033	0.069	23	
30	16	18	40	41	40-999	28	28	28	29	31	34	40	46	49	51	50	46	39	34	28	24	20	18	0.034	0.051	23	
31	18	18	17	18	17-999-999	13	15	19	26	33	38	44	48	49	40	31	28	28	27	28	28	29	0.028	0.049	22		
AVG	49	48	47	46	45-999	42	39	41	49	59	66	72	76	77	77	76	74	72	69	65	58	54	49	0.059			
MAX	72	73	77	73	72-999	75	61	60	78	99	114	117	118	114	113	118	121	115	115	125	131	114	71	0.131			
DAYS	31	31	31	31	30	0	30	29	28	31	31	31	31	30	31	30	31	31	30	31	31	31	31	31			703

STANDARD DEVIATION 0.02278

NOTE: -999 INDICATES INVALID DATA OR LESS THAN 75 PERCENT VALID DATA INCLUDED







ESCSYS AIR QUALITY MONITORING SYSTEM

( 1 HOUR RUNNING AVERAGES)

Validated Database

AIRS CODES

SITE .....WRALTOWR  
 PARAMETER ....HI  
 MONTH .....Jul 99  
 UNITS .....PPM X (10<sup>-3</sup>)

TRANSACTION CODE: 1  
 STATE CODE: 37  
 INTERVAL CODE: 1

SITE CODE: 0017  
 COUNTY CODE: 183  
 UNITS CODE: 007

PARAMETER CODE: 44201  
 PARM OCC CODE: 6  
 METHOD CODE: 019

DAY	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	MAX	RDS		
1	40	39	40	38	38	38-999	31	31	36	39	41	45	53	56	58	58	52	54	36	35	33	30	30	0.041	0.058	23			
2	32	31	34	35	29	22-999	22	27	20	22	32	36	40	43	50	53	52	53	50	37	31	29	29	0.035	0.053	23			
3	28	32	34	25	27	27-999	24	23	29	34	40	42	42	46	52	54	53	52	53	46	34	32	28	0.037	0.054	23			
4	32	28	27	28	36	37-999	42	40	43	42	46	46	46	47	49	51	53	51	46	45	44	46	45	0.042	0.053	23			
5	40	46	63	40	42	53-999	44	59	65	79	67	69	68	82	90	98	90	89	104	85	83	80	81	0.070	0.104	23			
6	79	81	78	67	59	41-999	42	54	60	74	105	111	103	107	110	111	102	95	76	72	74	78	80	0.081	0.111	23			
7	79	63	70	67	70	71-999	67	66	56	60	68	74	76	78	80	81	79	73	67	65	36	35	32	0.066	0.081	23			
8	43	60	62	66	65	65-999	52-999-999-999	64	69	86	91	100	99	90	83	78	77	75	76	67	62	55	61	55	50	50	0.066	0.084	22
9	78	62	64	58-999	70-999	67	64	66	81	84	79	73	74	75	68	67	62	55	55	57	62	63	63	0.058	0.070	23			
10	53	52	55	58	61	59-999	49	49	53	57	60	58	59	62	66	67	70	56	55	57	62	63	63	0.043	0.064	23			
11	59	64	57	39	47	46-999	37	31	27	30	27	32	40	41	42	46	46	47	49	50	47	49	46	0.039	0.050	23			
12	39	46	42	40	42	50-999	44	47	44	40	38	35	35	36	36	36	35	34	34	35	38	38	38	0.032	0.039	23			
13	38	39	39	32	31	33-999	33	34	33	32	29	27	28	27	29	28	31	30	31	32	32	36	34	0.031	0.038	23			
14	31	32	32	31	30	25-999	19	24	28	29	29	30	33	33	35	37	38	36	34	34	33	33	30	0.037	0.052	23			
15	29	29	29	32	30	30-999	30	27	21	29	36	38	41	41	41	43	44	49	52	45	33	49	50	0.056	0.070	23			
16	53	53	53	53	52	52-999	47	46	41	50	58	59	61	61	64	66	70	70	65	58	57	49	49	0.066	0.086	23			
17	50	50	50	50	51	51-999	54	66	69	66	68	73	75	73	75	77	80	86	86	81	62	52	65	0.065	0.073	23			
18	66	65	67	73	72	70-999	69	73	69	58	59	62	59	59	64	64	63	68	67	66	64	65	58	0.070	0.087	23			
19	54	51	59	60	52	53-999	63	65	65	69	82	78	77	68	71	79	83	80	83	86	87	80	74	0.085	0.119	23			
20	89	83	67	72	72	71-999	65	71	81	93	113	117	118	119	115	108	90	83	72	65	73	66	63	0.062	0.072	22			
21	64	60	49	47	53	58-999	57	60	56-999	57	62	71	72	71	71	71	68	66	63	65	68	64	72	0.081	0.102	23			
22	71	70	68	72	72	66-999	66	67	53	74	89	101	102	95	98	96	93	90	86	84	85	94	76	0.081	0.102	23			
23	68	65	62	57	76	72-999	66	67	69	72	78	80	84	89	95	97	102	91	92	95	93	93	92	0.083	0.103	23			
24	99	99	97	103	101	101-999	90	87	87	85	84	82	83	81	76	77	74	75	72	65	61	65	70	0.070	0.093	23			
25	73	72	72	58	50	68-999	60	50	47	60	70	79	83	88	93	90	76	74	78	78	72	65	53	0.077	0.092	23			
26	71	76	76	68	65	64-999	61	63	66	80	80	80	84	86	92	92	89	89	86	83	73	71	71	0.097	0.126	23			
27	72	78	85	83	82	84-999	85	88	88	78	91	119	126	107	95	108	123	120	111	103	102	102	102	0.092	0.112	23			
28	100	100	93	88	81	81-999	72	77	86	92	95	92	96	101	101	102	101	108	112	95	89	80	76	0.075	0.085	20			
29	76	77	74	73	71	59-999	60-999-999-999	83	85	80	80	77	75	75	78	81	82	80	80	80	73	68	68	0.081	0.103	23			
30	74	64	66	70	72	79-999	60	72	78	80	84	103	100	101	91	86	88	99	95	93	75	72	64	0.085	0.111	23			
31	59	65	72	87	89	85-999	71	71	71	71	75	84	93	91	92	92	96	96	95	87	101	111	104	0.085	0.111	23			
AVG	59	59	59	57	57	57-999	53	55	55	60	66	69	71	72	74	75	73	72	70	66	63	62	60	0.064					
MAX	100	100	97	103	101	101-999	90	88	88	93	113	119	126	119	115	111	123	120	112	103	102	111	104	0.126					
DAYS	31	31	31	31	30	31	0	31	29	29	28	31	31	31	31	31	31	31	31	31	31	31	31	31			705		

STANDARD DEVIATION 0.02244

NOTE: -999 INDICATES INVALID DATA OR LESS THAN 75 PERCENT VALID DATA INCLUDED

ESCSYS AIR QUALITY MONITORING SYSTEM

( 1 HOUR RUNNING AVERAGES)

Validated Database

AIRS CODES

SITE .....WRALTOWR  
 PARAMETER ....HI  
 MONTH .....Aug 99  
 UNITS .....PPM X (10 ^ 3)

TRANSACTION CODE: 1  
 STATE CODE: 37  
 INTERVAL CODE: 1

SITE CODE: 0017  
 COUNTY CODE: 183  
 UNITS CODE: 007

PARAMETER CODE: 44201  
 PARN OCC CODE: 6  
 METHOD CODE: 019

DAY	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	MAX	RDS
1	93	87	86	90	78	71-999	74	69	77	90	94	91	82	85	89	81	83	84	85	75	63	65	63	0.081	0.094	23	
2	61	64	61	60-999	50-999	39	44	50	57	62	61	63	65	64	65	64	64	61	62	64	69	73	0.060	0.073	22		
3	80	83	80	64	44	57-999	44	43	52	60	65	65	68	76	83	87	98	104	97	88	65	59	69	0.071	0.104	23	
4	66	62	70	73	68	70-999	66	58	62	66	73	76	77	80	83	87	89	88	83	70	73	72	69	0.073	0.089	23	
5	72	76	76	76	73	67-999	79	97	87	97	104	98	97	104	102	96	94	103	102	97	86	88	96	0.090	0.104	23	
6	104	75	94	78	68	66-999	77	78	79	79	81	86	97	102	106	107	108	109	100	98	97	89	88	0.090	0.109	23	
7	84	82	80	78	82	84-999	71	74	80	88	94	98	106	102	100	104	97	93	88	75	61	80	47	0.085	0.106	23	
8	30	42	43	50	57	59-999	51	49	44	55	64	76	78	75	77	77	84	89	91	80	73	73	69	0.065	0.091	23	
9	59	66	68	69	73	74-999	56	47	37	35	39	42	45	45	44	48	52	55	58	59	59	62	64	0.055	0.074	23	
10	67	86	86	85	80	65-999	55	50	53	66	73	81	87	85	83	83	85	81	77	78	68	66	60	0.074	0.087	23	
11	62	60	59	61	66	66-999	65	74	78	67	74	90	90	82	76	79	83	85	96	93	83	79	81	0.076	0.096	23	
12	79	73	66	63	65	62-999	64	70-999-999	91	109	118	113	112	108	82	83	88	82	81	78	76	0.084	0.118	21			
13	76	71	73	63	59	63-999	60	68	61	64	69	73	75	77	74	64	66-999	67	61	60	55	49	0.065	0.077	22		
14	48	47	53	71	61	72-999	51-999	51	56	59	66	76	82	71	72	73	76	75	71	65	72	74	0.066	0.082	22		
15	76	76	76	69	60	52-999	49	51	58	49	55	60	60	62	63	62	64	66	69	70	66	62	59	0.062	0.076	23	
16	58	59	57	53	53	54-999	54	52	49	52	57	61	63	67-999	69	71	74	78	71	66	52	66	0.061	0.078	22		
17	59	58	59	60	57	60-999	58	61	63	68	72	77	78	79	77	80	84	84	84	82	81	76	72	0.071	0.084	23	
18	70	80	73	73	85	87-999	80	84	85	89	109	118	114	107	109	115	119	117	123	124	120	115	70	0.099	0.124	23	
19	64	66	63	63	75	86-999	83	70	65	72	76	81	86	87	89	89	90	92	81	82	78	74	72	0.078	0.092	23	
20	66	61	65	61	61	60-999	68	69	71	72	66	72	79	77	74	69	71	77	76	74	70	63	68	0.069	0.079	23	
21	69	72	73	71	69	68-999	56	57	60	57	72	77	77	76	76	79	74	75	76	76	75	72	71	0.071	0.079	23	
22	72	72	72	73	73	73-999	72	73	60	56	59	63	65	66	68	71	71	71	72	74	73	71	61	0.069	0.074	23	
23	61	63	63	60	59	59-999	56	59	55	59	65	68	71	71	73	74	70	63	62	64	66	67	67	0.064	0.074	23	
24	66	65	64	63	62	62-999	57	58	53	50	49	51-999	54	56	57	55	56	54	53	50	47	43	0.056	0.066	22		
25	38	43	39	38	37-999-999	36	38	37	31	27	28	33	41	47	50	50	47	38	37	43	44	49	0.040	0.050	22		
26	54	44	37	35	41	45-999	45	44-999-999	47	51	53	57	53	55	54	50	45	40	40	34	31	0.045	0.057	21			
27	34	43	40	40	43	43-999	48	51	45	50	65	83	92	100	108	110	107	105	104	99	81	77	80	0.072	0.110	23	
28	81	81	79	78	75	75-999	85	94	89	80	78	79	82	84	85	85	84	86	88	93	91	82	58	0.082	0.094	23	
29	54	48	55	62	63	64-999	35	32	24	24	38	54	60	66	66	67	68	57	48	23	18	19	18	0.046	0.068	23	
30	17	19	40	42	41	37-999	28	29	30	31	34	40	46	49	51	50	47	40	35	29	25	21	20	0.035	0.051	23	
31	21	21	21	23	22	22-999	21	20	21	26	32	38	43	48	49	42	37	30	29	29	29	31	32	0.030	0.049	23	
AVG	63	63	64	63	62	62-999	58	58	58	60	66	71	75	76	77	77	77	77	75	71	67	65	62	0.067			
MAX	104	87	94	90	85	87-999	85	97	89	97	109	118	118	113	112	115	119	117	123	124	120	115	96		0.124		
DAYS	31	31	31	31	30	30	0	31	30	29	29	31	31	30	31	30	31	31	30	31	31	31	31			703	

STANDARD DEVIATION 0.01986

NOTE: -999 INDICATES INVALID DATA OR LESS THAN 75 PERCENT VALID DATA INCLUDED  
 A-21





## **Appendix B**

### **Speciated PAMS Hydrocarbon Reports**

May 31, 1999 Tower Hydrocarbon Samples

	Ground		820 Feet		1420 Feet	
	Am	Pm	Am	PM	Am	Pm
	Conc	Conc	Conc	Conc	Conc	Conc
Methane	33.0	30.4	40.1	NA	36.8	38.9
ETHANE	7.7	3.9	2.7	NA	2.7	2.6
ETHYLENE	0.7	1.5	0.0	NA	0.9	0.6
PROPANE	4.2	2.4	1.2	NA	0.9	1.1
PROPYLENE	0.8	0.7	0.4	NA	0.3	0.5
ISOBUTANE	1.5	0.6		NA		0.4
BUTANE	1.8	1.0		NA		0.8
ACETYLENE	0.9	0.4	1.1	NA	0.5	0.7
TRANS-2-BUTENE				NA		
1-BUTENE				NA	0.4	0.3
CIS-2-BUTENE				NA		
CYCLOPENTANE	2.1			NA		
ISOPENTANE	1.9	1.6	0.3	NA	0.4	0.8
PENTANE	0.9	3.6	0.3	NA	0.6	0.4
TRANS-2-PENTENE				NA		
1-PENTENE	0.3			NA		
CIS-2-PENTENE				NA		
2,2-DIMETHYLBUTANE				NA		
2,3-DIMETHYLBUTANE				NA		
2-METHYLPENTANE	0.4	0.5		NA		
3-METHYLPENTANE				NA		
ISOPRENE	1.6	12.1	0.6	NA	0.7	2.4
1-HEXENE				NA	0.3	
HEXANE	0.4			NA		
METHYLCYCLOPENTANE				NA		
2,4-DIMETHYLPENTANE				NA		
BENZENE		1.3	3.2	NA		
CYCLOHEXANE				NA		
2-METHYLHEXANE				NA		
2,3-DIMETHYLPENTANE				NA		
3-METHYLHEXANE	0.6			NA		
2,2,4-TRIMETHYLPENTANE		3.2		NA		
HEPTANE	0.8			NA		
METHYLCYCLOHEXANE	0.7			NA		
2,3,4-TRIMETHYLPENTANE		0.4		NA		
TOLUENE	4.1	6.0	1.4	NA	4.8	2.1
2-METHYLHEPTANE				NA		
3-METHYLHEPTANE				NA		
N-OCTANE				NA	2.8	0.5
ETHYLBENZENE				NA		
M/P-XYLENE	2.2	1.3		NA		
STYRENE				NA		
O-XYLENE		0.5		NA		
NONANE				NA		
ISOPROPYLBENZENE				NA		
N-PROPYLBENZENE				NA		
M-ETHYLTOLUENE	0.6	0.5	1.2	NA	1.3	1.6
P-ETHYLTOLUENE				NA		
1,3,5-TRIMETHYLBENZENE				NA		
O-ETHYLTOLUENE				NA		
1,2,4-TRIMETHYLBENZENE	1.6	2.2	2.2	NA		1.5
DECANE	2.1			NA		
1,2,3-TRIMETHYLBENZENE	1.6	1.4		NA		
M-DIETHYLBENZENE	0.6			NA		
P-DIETHYLBENZENE	0.7			NA		
UNDECANE	0.7	3.0	1.7	NA	3.1	5.6
DODECANE				NA		4.3

Total Hydrocarbons	74.5	79.3	56.9	NA	59.4	68.8
Total NMOC	41.5	48.9	16.7	NA	22.6	29.9
Unknowns	0.0	0.9	0.5	NA	2.9	3
Known NMOC	41.5	48.0	16.2	NA	19.7	26.9

June 14, 1999 Tower Hydrocarbon Samples

	Ground		820 Feet		1420 Feet	
	AM	PM	AM	PM	AM	PM
	Conc	Conc	Conc	Conc	Conc	Conc
METHANE	30.2	44.0	39.8	39.4	36.2	37.1
ETHANE	4.5	2.6	1.9	2.3	2.1	1.9
ETHYLENE	1.5	1.2		0.7		
PROPANE	4.5	1.4	0.7	1.1	0.4	0.9
PROPYLENE	1.0	1.2	0.4	0.4	0.3	0.4
ISOBUTANE	1.1	0.6				
BUTANE	6.5	0.7	0.9	0.8	0.5	0.5
ACETYLENE	0.6	0.9	0.8	1.2	0.5	1.1
TRANS-2-BUTENE						
1-BUTENE	0.4				0.4	0.3
CIS-2-BUTENE						
CYCLOPENTANE						
ISOPENTANE	2.6	1.2	0.5	1.1	0.5	0.8
PENTANE	1.4	0.8	0.3	0.5	0.5	0.5
TRANS-2-PENTENE						
1-PENTENE						
CIS-2-PENTENE						
2,2-DIMETHYLBUTANE	0.3			0.5		
2,3-DIMETHYLBUTANE	0.3			0.5		
2-METHYLPENTANE	0.6	0.4				
3-METHYLPENTANE				0.4		
ISOPRENE	4.1	17.0	0.4	4.2	1.6	3.7
1-HEXENE						
HEXANE	1.0					
METHYLCYCLOPENTANE						
2,4-DIMETHYLPENTANE						
BENZENE	1.2	1.2	2.5	3.0	0.9	0.5
CYCLOHEXANE						
2-METHYLHEXANE	0.4					
2,3-DIMETHYLPENTANE		0.4		0.4		
3-METHYLHEXANE	0.8	0.3				
2,2,4-TRIMETHYLPENTANE	1.5	5.5			0.8	
HEPTANE	1.0					
METHYLCYCLOHEXANE				0.5		
2,3,4-TRIMETHYLPENTANE		0.7				
TOLUENE	25.9	12.7	1.8	2.3	8.8	2.9
2-METHYLHEPTANE						
3-METHYLHEPTANE						
N-OCTANE	3.5				2.9	2.6
ETHYLBENZENE	2.5					
M/P-XYLENE	7.0					
STYRENE						
O-XYLENE	2.8					
NONANE	0.5					
ISOPROPYLBENZENE				0.8		
N-PROPYLBENZENE						
M-ETHYLTOLUENE	1.6	0.5		0.7	0.9	0.8
P-ETHYLTOLUENE						
1,3,5-TRIMETHYLBENZENE						
O-ETHYLTOLUENE				0.7		
1,2,4-TRIMETHYLBENZENE	6.5	3.4	1.7	2.6		
DECANE	2.2			2.0		
1,2,3-TRIMETHYLBENZENE	3.5	1.5	0.8	1.3		
M-DIETHYLBENZENE	1.1					
P-DIETHYLBENZENE						
UNDECANE	2.4	0.5	0.5	1.2	3.0	1.3
DODECANE	2.5				0.6	

Total Hydrocarbons	129.7	99.5	54.0	69.5	63.9	57.1
Total NMOC	99.6	55.6	14.2	30.0	27.7	20.0
Unknowns	2.5	0.9	1.1	0.8	3.2	1.7
Known NMOC	97.1	54.7	13.1	29.2	24.5	18.3

June 21, 1999 Tower Hydrocarbon Samples

	Ground		820 Feet		1420 Feet	
	AM	PM	AM	PM	AM	PM
	Conc	Conc	Conc	Conc	Conc	Conc
METHANE	37.2	NA	43.2	NA	44.0	38.4
ETHANE	2.7	NA	5.8	NA	4.4	2.3
ETHYLENE	1.0	NA	5.5	NA	4.2	1.2
PROPANE	2.0	NA	4.0	NA	3.2	1.4
PROPYLENE	0.6	NA	1.0	NA		0.8
ISOBUTANE	0.4	NA	1.1	NA	1.3	
BUTANE	0.8	NA	2.6	NA	2.0	0.4
ACETYLENE	0.9	NA	31.2	NA	20.9	
TRANS-2-BUTENE		NA		NA		
1-BUTENE	0.5	NA		NA	0.5	0.1
CIS-2-BUTENE		NA		NA	0.3	
CYCLOPENTANE		NA		NA		
ISOPENTANE	1.7	NA	2.4	NA	2.2	0.7
PENTANE	0.8	NA	1.0	NA	0.9	0.5
TRANS-2-PENTENE		NA		NA		
1-PENTENE		NA		NA		
CIS-2-PENTENE		NA		NA		
2,2-DIMETHYLBUTANE		NA	0.3	NA		
2,3-DIMETHYLBUTANE		NA		NA		
2-METHYLPENTANE	0.4	NA	0.5	NA	0.5	0.4
3-METHYLPENTANE		NA		NA		
ISOPRENE	1.1	NA	0.5	NA	0.9	1.2
1-HEXENE		NA		NA		
HEXANE		NA	1.2	NA	0.4	
METHYLCYCLOPENTANE		NA		NA		
2,4-DIMETHYLPENTANE		NA		NA		
BENZENE	1.3	NA	3.9	NA	1.4	1.8
CYCLOHEXANE		NA		NA		
2-METHYLHEXANE		NA		NA		
2,3-DIMETHYLPENTANE		NA		NA		
3-METHYLHEXANE		NA	0.6	NA	0.4	
2,2,4-TRIMETHYLPENTANE	1.2	NA	1.2	NA	0.8	1.2
HEPTANE		NA	0.4	NA	0.6	
METHYLCYCLOHEXANE		NA		NA		
2,3,4-TRIMETHYLPENTANE		NA		NA	0.3	
TOLUENE	17.8	NA	4.1	NA	4.7	3.7
2-METHYLHEPTANE		NA		NA		
3-METHYLHEPTANE		NA		NA		
N-OCTANE		NA	1.2	NA	0.6	2.6
ETHYLBENZENE		NA	0.5	NA	0.6	
M/P-XYLENE	1.9	NA	2.1	NA	2.0	1.3
STYRENE		NA		NA		
O-XYLENE	0.6	NA	1.2	NA	1.1	
NONANE		NA	0.4	NA		
ISOPROPYLBENZENE		NA		NA		
N-PROPYLBENZENE		NA		NA		
M-ETHYLTOLUENE	1.0	NA	0.9	NA	0.8	0.4
P-ETHYLTOLUENE		NA		NA		
1,3,5-TRIMETHYLBENZENE		NA		NA		
O-ETHYLTOLUENE		NA		NA		
1,2,4-TRIMETHYLBENZENE	3.9	NA	1.6	NA		
DECANE		NA	1.0	NA	2.1	
1,2,3-TRIMETHYLBENZENE	0.9	NA	1.0	NA	0.4	
M-DIETHYLBENZENE		NA	0.4	NA		
P-DIETHYLBENZENE		NA		NA		
UNDECANE	1.0	NA	0.8	NA	0.8	
DODECANE	3.3	NA		NA	0.6	4.3

Total Hydrocarbons	87.7	NA	125.7	NA	106.1	66.4
Total NMOC	50.6	NA	82.5	NA	62.1	28.0
Unknowns	4.6	NA	4.1	NA	3.3	3.8
Known NMOC	46.0	NA	78.4	NA	58.8	24.2

June 28, 1999 Tower Hydrocarbon Samples

	Ground		820 Feet		1420 Feet	
	AM	PM	AM	PM	AM	PM
	Conc	Conc	Conc	Conc	Conc	Conc
METHANE	34.3	35.4	36.7	25.8	34.7	33.6
ETHANE	1.7	2.3	1.8	1.6	2.0	2.0
ETHYLENE	1.2	1.0	0.8	0.7	0.6	0.4
PROPANE	2.0	2.1	1.5	0.7	2.0	2.0
PROPYLENE	1.1	16.8	0.5	0.5	0.4	0.4
ISOBUTANE	0.5	0.8				0.8
BUTANE	0.8	1.3	0.5		0.6	1.0
ACETYLENE			1.0	0.6		0.7
TRANS-2-BUTENE						
1-BUTENE						
CIS-2-BUTENE						
CYCLOPENTANE						
ISOPENTANE	1.6	1.7	2.0	0.6	1.0	1.4
PENTANE	0.7	1.0	0.4		0.5	0.8
TRANS-2-PENTENE						0.3
1-PENTENE						
CIS-2-PENTENE						
2,2-DIMETHYLBUTANE						0.4
2,3-DIMETHYLBUTANE						
2-METHYLPENTANE	0.3	0.5		1.3	0.3	0.3
3-METHYLPENTANE						
ISOPRENE		13.8	1.8	1.2	1.5	2.6
1-HEXENE						
HEXANE						0.5
METHYLCYCLOPENTANE						
2,4-DIMETHYLPENTANE						
BENZENE	1.0	1.0	2.5	1.3	1.3	0.8
CYCLOHEXANE						
2-METHYLHEXANE						
2,3-DIMETHYLHEXANE						
3-METHYLHEXANE						
2,2,4-TRIMETHYLPENTANE		3.6			0.5	
HEPTANE						
METHYLCYCLOHEXANE						0.4
2,3,4-TRIMETHYLPENTANE		0.4				
TOLUENE	16.3	6.6	1.2	0.9	4.1	2.8
2-METHYLHEPTANE						
3-METHYLHEPTANE						
N-OCTANE					1.7	2.5
ETHYLBENZENE						
M/P-XYLENE						
STYRENE						
O-XYLENE						
NONANE						
ISOPROPYLBENZENE						
N-PROPYLBENZENE						
M-ETHYLTOLUENE	0.9	0.5	0.6		0.7	2.3
P-ETHYLTOLUENE						
1,3,5-TRIMETHYLBENZENE						
O-ETHYLTOLUENE						0.9
1,2,4-TRIMETHYLBENZENE	5.7	3.5	1.6	1.7		
DECANE						
1,2,3-TRIMETHYLBENZENE	1.1	0.5	0.8		0.5	1.0
M-DIETHYLBENZENE						0.7
P-DIETHYLBENZENE						0.4
UNDECANE	0.4		4.3		1.8	2.1
DODECANE						

Total Hydrocarbons	73.4	100.5	60.4	39.1	63.0	70.8
Total NMOC	31.9	61.0	17.0	11.5	26.0	33.1
Unknowns	3.8	7.6	2.2	2.1	8.7	9.9
Known NMOC	28.1	53.4	14.8	9.4	17.3	23.2

July 30, 1999 Tower Hydrocarbon Samples

	Ground		820 Feet		1420 Feet	
	AM	PM	AM	PM	AM	PM
Methane	39.3	29.9	32.3	27.1	NA	35.6
ETHANE	6.4	6.0	7.1	4.1	NA	4.0
ETHYLENE	5.7	3.3	1.3		NA	1.5
PROPANE	20.0	5.3	4.2	2.8	NA	3.2
PROPYLENE	4.7	5.6	23.3		NA	
ISOBUTANE	2.9	1.2	1.4		NA	0.8
BUTANE	6.3	2.0	2.1	2.8	NA	1.5
ACETYLENE	3.2	2.0	1.6	0.9	NA	1.4
TRANS-2-BUTENE	0.5				NA	
1-BUTENE	0.6	0.3	0.7		NA	0.7
CIS-2-BUTENE	0.7				NA	0.6
CYCLOPENTANE	0.9	0.4		2.0	NA	2.3
ISOPENTANE	24.8	6.6	2.5	3.8	NA	4.4
PENTANE	9.4	2.8	1.5	1.2	NA	1.7
TRANS-2-PENTENE	2.4	0.8			NA	
1-PENTENE	1.2	0.5			NA	
CIS-2-PENTENE	1.5	0.4			NA	
2,2-DIMETHYLBUTANE	2.2	0.6	0.3		NA	
2,3-DIMETHYLBUTANE	2.5	0.9			NA	
2-METHYLPENTANE	8.2	3.2			NA	0.4
3-METHYLPENTANE	4.7	1.9	0.4	0.6	NA	
ISOPRENE	15.1	37.3	0.6	1.5	NA	4.8
1-HEXENE				0.8	NA	
HEXANE	3.8	1.0	0.5	0.4	NA	
METHYLCYCLOPENTANE	2.7	1.0			NA	
2,4-DIMETHYLPENTANE	1.2				NA	
BENZENE	5.4	1.4	2.5		NA	1.8
CYCLOHEXANE	0.9				NA	
2-METHYLHEXANE	1.5	0.7		0.6	NA	
2,3-DIMETHYLPENTANE	2.4				NA	
3-METHYLHEXANE	2.4	1.0		1.1	NA	
2,2,4-TRIMETHYLPENTANE	7.6	8.6			NA	1.0
HEPTANE	3.1	0.5		1.7	NA	
METHYLCYCLOHEXANE	1.1	0.8	1.1		NA	0.9
2,3,4-TRIMETHYLPENTANE	2.2	1.4			NA	0.9
TOLUENE	21.8	10.2	2.9	6.3	NA	8.0
2-METHYLHEPTANE	2.2	1.3			NA	0.6
3-METHYLHEPTANE	1.3	0.7	2.1		NA	
N-OCTANE	0.6				NA	
ETHYLBENZENE	2.7	1.2	1.9		NA	
M/P-XYLENE	10.0	3.4	7.0	2.9	NA	
STYRENE					NA	
O-XYLENE	3.5	2.3	2.1		NA	
NONANE				0.7	NA	
ISOPROPYLBENZENE					NA	
N-PROPYLBENZENE	0.7	1.0			NA	
M-ETHYLTOLUENE	6.9	4.8	1.3		NA	0.5
P-ETHYLTOLUENE				1.0	NA	
1,3,5-TRIMETHYLBENZENE		2.2		1.6	NA	
O-ETHYLTOLUENE	0.5	0.6			NA	
1,2,4-TRIMETHYLBENZENE	5.8	5.6	1.6	2.3	NA	
DECANE				2.1	NA	
1,2,3-TRIMETHYLBENZENE	8.6	2.8	5.4	2.7	NA	0.9
M-DIETHYLBENZENE				2.9	NA	
P-DIETHYLBENZENE		0.6			NA	
UNDECANE	1.5	2.7	3.0	1.0	NA	3.0
DODECANE	1.2	0.8	1.7		NA	0.7

Total Hydrocarbons	272.7	168.5	113.1	77.3	NA	90.7
Total NMOC	233.4	138.6	80.8	50.1	NA	55.2
Unknowns	8.1	0.7	0.0	0.0	NA	0.7
Known NMOC	225.3	137.9	80.8	50.1	NA	54.5

July 10 1999 Tower Hydrocarbon Samples

	Ground		820 Feet		1420 Feet	
	AM	PM	AM	PM	AM	PM
	Conc	Conc	Conc	Conc	Conc	Conc
Methane	30.5	38.1	35.3	NA	33.2	33.9
ETHANE	1.6	4.1	3.4	NA	2.9	1.7
ETHYLENE	13.5	2.4	1.7	NA	0.8	
PROPANE	3.1	2.3	2.5	NA	1.9	1.7
PROPYLENE	1.6	2.4	3.0	NA	0.4	0.4
ISOBUTANE	0.8	1.6	2.0	NA	0.5	0.4
BUTANE	0.8	1.9	1.1	NA	0.9	0.8
ACETYLENE	1.4	1.0	1.4	NA	1.0	1.3
TRANS-2-BUTENE				NA		
1-BUTENE		0.5	0.5	NA		
CIS-2-BUTENE				NA		
CYCLOPENTANE				NA		
ISOPENTANE	2.0	2.5	2.2	NA	1.6	1.2
PENTANE	1.5	1.1	1.0	NA	0.8	0.5
TRANS-2-PENTENE				NA		
1-PENTENE		0.4	0.5	NA		
CIS-2-PENTENE				NA		
2,2-DIMETHYLBUTANE				NA		
2,3-DIMETHYLBUTANE			0.3	NA		
2-METHYLPENTANE	0.4	0.6	0.4	NA	0.3	
3-METHYLPENTANE				NA		
ISOPRENE	7.7	27.2	9.2	NA	0.6	6.1
1-HEXENE				NA		
HEXANE		0.4		NA		
METHYLCYCLOPENTANE				NA		
2,4-DIMETHYLPENTANE				NA		
BENZENE	2.0	0.8	4.0	NA	2.6	
CYCLOHEXANE				NA		
2-METHYLHEXANE				NA		
2,3-DIMETHYLPENTANE				NA		
3-METHYLHEXANE				NA		
2,2,4-TRIMETHYLPENTANE	2.2	5.2	1.4	NA	0.1	0.9
HEPTANE				NA		
METHYLCYCLOHEXANE				NA		
2,3,4-TRIMETHYLPENTANE	0.5	0.6		NA		
TOLUENE	14.9	6.7	2.7	NA	7.3	3.1
2-METHYLHEPTANE				NA		
3-METHYLHEPTANE				NA		
N-OCTANE				NA	2.8	3.0
ETHYLBENZENE				NA		
M/P-XYLENE				NA		
STYRENE				NA		
O-XYLENE	1.1			NA		
NONANE				NA		
ISOPROPYLBENZENE				NA		
N-PROPYLBENZENE				NA		
M-ETHYLTOLUENE	1.9	1.6		NA	1.0	
P-ETHYLTOLUENE				NA		
1,3,5-TRIMETHYLBENZENE				NA		
O-ETHYLTOLUENE				NA		
1,2,4-TRIMETHYLBENZENE	8.0	5.3	1.9	NA		
DECANE				NA		
1,2,3-TRIMETHYLBENZENE	1.5	2.6	0.9	NA		
M-DIETHYLBENZENE				NA		
P-DIETHYLBENZENE				NA		
UNDECANE	1.0	2.0		NA	2.6	
DODECANE				NA		

Total Hydrocarbons	99.5	111.7	75.8	NA	65.0	59.1
Total NMOC	69.0	73.6	40.4	NA	31.8	25.2
Unknowns	1.4	0.5	0.5	NA	3.2	4.2
Known NMOC	67.6	73.1	39.9	NA	28.6	21.0

July 19, 1999 Tower Hydrocarbon Samples

	Ground		820 Ft		1420 Ft	
	AM	PM	AM	PM	AM	PM
Methane	32.5	37.6	36.3	NA	NA	36.6
ETHANE	1.9	2.8	4.1	NA	NA	4.9
ETHYLENE	2.3	2.1	0.7	NA	NA	0.7
PROPANE	2.7	2.8	1.8	NA	NA	2.1
PROPYLENE	2.8		0.6	NA	NA	
ISOBUTANE	1.0	0.8		NA	NA	0.4
BUTANE	1.1	1.1	0.7	NA	NA	1.4
ACETYLENE	1.2	1.5	1.0	NA	NA	1.3
TRANS-2-BUTENE				NA	NA	
1-BUTENE				NA	NA	0.3
CIS-2-BUTENE				NA	NA	
CYCLOPENTANE				NA	NA	1.3
ISOPENTANE	2.4		1.1	NA	NA	1.4
PENTANE	0.7	0.6	0.5	NA	NA	0.5
TRANS-2-PENTENE				NA	NA	
1-PENTENE				NA	NA	
CIS-2-PENTENE				NA	NA	
2,2-DIMETHYLBUTANE				NA	NA	
2,3-DIMETHYLBUTANE				NA	NA	
2-METHYLPENTANE	0.5	0.4	0.5	NA	NA	0.3
3-METHYLPENTANE				NA	NA	
ISOPRENE	5.5	24.7	2.8	NA	NA	4.4
1-HEXENE				NA	NA	
HEXANE				NA	NA	
METHYLCYCLOPENTANE				NA	NA	
2,4-DIMETHYLPENTANE				NA	NA	
BENZENE	2.2	1.7	3.5	NA	NA	1.2
CYCLOHEXANE	1.7	0.9	2.6	NA	NA	
2-METHYLHEXANE				NA	NA	
2,3-DIMETHYLPENTANE				NA	NA	
3-METHYLHEXANE				NA	NA	
2,2,4-TRIMETHYLPENTANE	1.9	4.3		NA	NA	0.7
HEPTANE				NA	NA	
METHYLCYCLOHEXANE	0.5	0.4	0.6	NA	NA	
2,3,4-TRIMETHYLPENTANE				NA	NA	
TOLUENE	22.4	7.2	1.7	NA	NA	6.3
2-METHYLHEPTANE				NA	NA	
3-METHYLHEPTANE				NA	NA	0.9
N-OCTANE	1.1	0.7	0.7	NA	NA	7.0
ETHYLBENZENE				NA	NA	
M/P-XYLENE	1.2			NA	NA	
STYRENE				NA	NA	
O-XYLENE				NA	NA	
NONANE				NA	NA	
ISOPROPYLBENZENE				NA	NA	
N-PROPYLBENZENE				NA	NA	
M-ETHYLTOLUENE	1.4	1.9		NA	NA	0.7
P-ETHYLTOLUENE				NA	NA	
1,3,5-TRIMETHYLBENZENE				NA	NA	
O-ETHYLTOLUENE				NA	NA	
1,2,4-TRIMETHYLBENZENE	7.3	3.2	2.8	NA	NA	
DECANE				NA	NA	
1,2,3-TRIMETHYLBENZENE	1.7	1.9	0.8	NA	NA	0.7
M-DIETHYLBENZENE				NA	NA	
P-DIETHYLBENZENE		0.4		NA	NA	
UNDECANE				NA	NA	
DODECANE	0.4			NA	NA	

Total Hydrocarbons	96.3	97.9	62.7	NA	NA	82.6
Total NMOC	63.8	60.3	26.5	NA	NA	46.0
Unknowns	0.0	1.1	0	NA	NA	9.4
Known NMOC	63.8	59.2	26.5	NA	NA	36.6



July 26, 1999 Tower Hydrocarbon Samples

	Ground		820 Ft		1420 Ft	
	AM	PM	AM	PM	AM	PM
METHANE	30.3	40.4	31.7	NA	NA	34.4
ETHANE	5.8	4.1	4.9	NA	NA	2.9
ETHYLENE	3.5	2.7		NA	NA	0.9
PROPANE	5.8	3.3	3.0	NA	NA	1.6
PROPYLENE	2.9	3.9		NA	NA	0.5
ISOBUTANE	1.6	1.0	0.7	NA	NA	0.3
BUTANE	2.9	1.7	1.3	NA	NA	1.0
ACETYLENE	2.8	1.6	0.7	NA	NA	1.4
TRANS-2-BUTENE	0.3			NA	NA	
1-BUTENE	0.6	0.3		NA	NA	0.6
CIS-2-BUTENE				NA	NA	0.3
CYCLOPENTANE				NA	NA	
ISOPENTANE	6.9	3.1	1.3	NA	NA	1.5
PENTANE	5.0	1.2	0.7	NA	NA	0.8
TRANS-2-PENTENE	0.4			NA	NA	
1-PENTENE	0.4			NA	NA	
CIS-2-PENTENE				NA	NA	0.4
2,2-DIMETHYLBUTANE	0.6			NA	NA	
2,3-DIMETHYLBUTANE	0.7			NA	NA	
2-METHYLPENTANE	1.7	0.7		NA	NA	
3-METHYLPENTANE	1.1			NA	NA	0.3
ISOPRENE	9.7	23.0	0.4	NA	NA	2.4
1-HEXENE				NA	NA	
HEXANE	0.6		0.9	NA	NA	
METHYLCYCLOPENTANE	0.5			NA	NA	
2,4-DIMETHYLPENTANE				NA	NA	
BENZENE	2.4	2.2	0.9	NA	NA	2.5
CYCLOHEXANE				NA	NA	
2-METHYLHEXANE				NA	NA	
2,3-DIMETHYLHEXANE				NA	NA	
3-METHYLHEXANE	1.7			NA	NA	
2,2,4-TRIMETHYLHEXANE	3.0	5.5		NA	NA	1.7
HEPTANE				NA	NA	
METHYLCYCLOHEXANE	0.5	0.9	2.1	NA	NA	2.7
2,3,4-TRIMETHYLHEXANE	0.6	0.6		NA	NA	0.9
TOLUENE	20.7	8.2	1.9	NA	NA	13.0
2-METHYLHEPTANE				NA	NA	
3-METHYLHEPTANE				NA	NA	
N-OCTANE				NA	NA	6.5
ETHYLBENZENE	0.8		0.5	NA	NA	
M/P-XYLENE	4.0		2.0	NA	NA	
STYRENE				NA	NA	
O-XYLENE	1.7		0.7	NA	NA	
NONANE				NA	NA	
ISOPROPYLBENZENE				NA	NA	
N-PROPYLBENZENE				NA	NA	
M-ETHYLTOLUENE	2.0			NA	NA	
P-ETHYLTOLUENE				NA	NA	
1,3,5-TRIMETHYLBENZENE				NA	NA	
O-ETHYLTOLUENE				NA	NA	
1,2,4-TRIMETHYLBENZENE	4.1	1.7	1.1	NA	NA	
DECANE				NA	NA	
1,2,3-TRIMETHYLBENZENE	2.6		1.1	NA	NA	1.2
M-DIETHYLBENZENE				NA	NA	5.9
P-DIETHYLBENZENE				NA	NA	
UNDECANE	0.8		1.8	NA	NA	
DODECANE	3.4			NA	NA	1.2

Total Hydrocarbons	134.4	107.2	57.8	NA	NA	93.9
Total NMOC	104.1	66.8	26.1	NA	NA	59.5
Unknowns	2.1	1.1	0.0	NA	NA	8.9
Known NMOC	102.0	65.7	26.1	NA	NA	50.6

August 6, 1999 Tower Hydrocarbon Samples

	Ground		820 Ft		1420 Ft	
	AM	PM	AM	PM	AM	PM
Methane	33.7	37.8	33.4	NA	34.7	35.1
ETHANE	8.5	6.9	3.8	NA	7.2	5.5
ETHYLENE	3.9	3.4	0.5	NA		0.5
PROPANE	9.6	5.7	3.4	NA	3.6	3.3
PROPYLENE	2.2	5.2	0.5	NA	0.4	
ISOBUTANE	2.0	1.9	0.5	NA	0.5	0.6
BUTANE	3.4	2.9	1.0	NA	1.6	1.4
ACETYLENE	3.0	1.5	1.1	NA	0.9	1.6
TRANS-2-BUTENE	0.4			NA		
1-BUTENE	0.9	0.5		NA	0.4	
CIS-2-BUTENE				NA	0.4	
CYCLOPENTANE				NA	1.0	1.4
ISOPENTANE	5.5	3.5	1.4	NA	2.7	0.7
PENTANE	2.7	1.7	0.5	NA	0.6	0.6
TRANS-2-PENTENE	0.5	0.5		NA		
1-PENTENE	0.4	0.6		NA		
CIS-2-PENTENE		0.4		NA	0.5	0.3
2,2-DIMETHYLBUTANE	0.9	0.5		NA		
2,3-DIMETHYLBUTANE	0.5	0.8		NA		
2-METHYLPENTANE	2.1	1.5	0.4	NA		
3-METHYLPENTANE	1.2	1.0		NA		
ISOPRENE	4.2	16.4	0.8	NA	0.8	7.9
1-HEXENE	0.3		2.2	NA		
HEXANE	2.4	1.4		NA		
METHYLCYCLOPENTANE	0.9			NA		
2,4-DIMETHYLPENTANE				NA		
BENZENE	2.5	1.6	1.2	NA	1.8	1.6
CYCLOHEXANE	1.3	0.7		NA		
2-METHYLHEXANE	1.1	0.6		NA		
2,3-DIMETHYLPENTANE				NA		
3-METHYLHEXANE	2.7	0.6		NA		
2,2,4-TRIMETHYLPENTANE	2.7	6.5		NA	2.1	0.5
HEPTANE	2.3	1.1		NA		
METHYLCYCLOHEXANE	0.8	0.5		NA	1.7	3.2
2,3,4-TRIMETHYLPENTANE	0.5	0.6		NA		
TOLUENE	19.8	10.0	2.1	NA	7.8	3.7
2-METHYLHEPTANE				NA		
3-METHYLHEPTANE				NA		
N-OCTANE				NA	6.2	4.4
ETHYLBENZENE	0.6	1.3		NA		
M/P-XYLENE	1.9	1.9	4.6	NA		
STYRENE				NA		
O-XYLENE	1.5	1.1	2.3	NA		
NONANE	0.7			NA		
ISOPROPYLBENZENE				NA		
N-PROPYLBENZENE				NA	2.3	2.3
M-ETHYLTOLUENE	2.6	0.4	0.8	NA	1.1	
P-ETHYLTOLUENE				NA		
1,3,5-TRIMETHYLBENZENE	1.1			NA		
O-ETHYLTOLUENE				NA		
1,2,4-TRIMETHYLBENZENE	3.8	3.2	2.0	NA		
DECANE	1.8			NA		
1,2,3-TRIMETHYLBENZENE	2.2	1.2	2.6	NA	0.3	
M-DIETHYLBENZENE	1.6			NA		
P-DIETHYLBENZENE	0.7			NA		
UNDECANE	1.2	2.4	1.6	NA		2.8
DODECANE				NA		

Total Hydrocarbons	147.8	130.3	70.7	NA	91.3	87.8
Total NMOC	114.0	92.5	37.2	NA	56.6	52.6
Unknowns	5	2.6	4.1	NA	12.7	8.3
Known NMOC	109.0	89.9	33.1	NA	43.9	44.3

August 13, 1999 Tower Hydrocarbon Samples

	Ground		820 Ft		1420 Ft	
	AM	PM	AM	PM	AM	PM
METHANE	28.8	NA	NA	NA	NA	33.1
ETHANE	3.8	NA	NA	NA	NA	4.1
ETHYLENE	1.2	NA	NA	NA	NA	0.9
PROPANE	2.3	NA	NA	NA	NA	3.0
PROPYLENE		NA	NA	NA	NA	0.4
ISOBUTANE	0.5	NA	NA	NA	NA	0.4
BUTANE	1.2	NA	NA	NA	NA	1.9
ACETYLENE	1.1	NA	NA	NA	NA	1.0
TRANS-2-BUTENE		NA	NA	NA	NA	
1-BUTENE		NA	NA	NA	NA	0.3
CIS-2-BUTENE		NA	NA	NA	NA	
CYCLOPENTANE		NA	NA	NA	NA	
ISOPENTANE	2.3	NA	NA	NA	NA	1.1
PENTANE	1.5	NA	NA	NA	NA	0.4
TRANS-2-PENTENE		NA	NA	NA	NA	
1-PENTENE		NA	NA	NA	NA	
CIS-2-PENTENE		NA	NA	NA	NA	
2,2-DIMETHYLBUTANE		NA	NA	NA	NA	
2,3-DIMETHYLBUTANE	0.4	NA	NA	NA	NA	
2-METHYLPENTANE	0.5	NA	NA	NA	NA	
3-METHYLPENTANE		NA	NA	NA	NA	
ISOPRENE	1.4	NA	NA	NA	NA	7.8
1-HEXENE		NA	NA	NA	NA	
HEXANE	0.4	NA	NA	NA	NA	
METHYLCYCLOPENTANE		NA	NA	NA	NA	
2,4-DIMETHYLPENTANE		NA	NA	NA	NA	
BENZENE		NA	NA	NA	NA	3.0
CYCLOHEXANE		NA	NA	NA	NA	
2-METHYLHEXANE	0.7	NA	NA	NA	NA	
2,3-DIMETHYLPENTANE		NA	NA	NA	NA	
3-METHYLHEXANE	1.2	NA	NA	NA	NA	
2,2,4-TRIMETHYLPENTANE		NA	NA	NA	NA	0.8
HEPTANE	1.5	NA	NA	NA	NA	
METHYLCYCLOHEXANE		NA	NA	NA	NA	
2,3,4-TRIMETHYLPENTANE		NA	NA	NA	NA	
TOLUENE	6.6	NA	NA	NA	NA	9.2
2-METHYLHEPTANE		NA	NA	NA	NA	
3-METHYLHEPTANE		NA	NA	NA	NA	
N-OCTANE		NA	NA	NA	NA	4.2
ETHYLBENZENE		NA	NA	NA	NA	
M/P-XYLENE		NA	NA	NA	NA	
STYRENE		NA	NA	NA	NA	
O-XYLENE		NA	NA	NA	NA	
NONANE		NA	NA	NA	NA	
ISOPROPYLBENZENE		NA	NA	NA	NA	1.2
N-PROPYLBENZENE		NA	NA	NA	NA	
M-ETHYLTOLUENE		NA	NA	NA	NA	1.2
P-ETHYLTOLUENE		NA	NA	NA	NA	
1,3,5-TRIMETHYLBENZENE	0.5	NA	NA	NA	NA	
O-ETHYLTOLUENE		NA	NA	NA	NA	
1,2,4-TRIMETHYLBENZENE	4.5	NA	NA	NA	NA	
DECANE	1.6	NA	NA	NA	NA	
1,2,3-TRIMETHYLBENZENE	1.2	NA	NA	NA	NA	
M-DIETHYLBENZENE	1.6	NA	NA	NA	NA	
P-DIETHYLBENZENE		NA	NA	NA	NA	
UNDECANE	2.7	NA	NA	NA	NA	4.8
DODECANE	1.8	NA	NA	NA	NA	

Total Hydrocarbons	70.5	NA	NA	NA	NA	84.5
Total NMOC	41.7	NA	NA	NA	NA	51.5
Unknowns	1.3	NA	NA	NA	NA	5.6
Known NMOC	40.4	NA	NA	NA	NA	45.9

August 24, 1999 Tower Hydrocarbon Samples

	Ground		820 Ft		1420 Ft	
	AM	PM	AM	PM	AM	PM
Methane	28.4	NA	NA	30.0	33.0	NA
ETHANE	4.9	NA	NA	3.9	5.8	NA
ETHYLENE	3.3	NA	NA	2.2	1.0	NA
PROPANE	3.9	NA	NA	4.3	2.9	NA
PROPYLENE	23.3	NA	NA	2.2	0.6	NA
ISOBUTANE	1.0	NA	NA	0.7	3.8	NA
BUTANE	1.8	NA	NA	1.5	8.7	NA
ACETYLENE	2.3	NA	NA	1.3	1.8	NA
TRANS-2-BUTENE		NA	NA		0.4	NA
1-BUTENE		NA	NA	0.9	0.6	NA
CIS-2-BUTENE		NA	NA		0.6	NA
CYCLOPENTANE		NA	NA		1.0	NA
ISOPENTANE	2.8	NA	NA	1.6	27.8	NA
PENTANE	1.3	NA	NA	1.9	9.7	NA
TRANS-2-PENTENE		NA	NA		2.8	NA
1-PENTENE		NA	NA	0.4	1.5	NA
CIS-2-PENTENE		NA	NA	0.8	1.4	NA
2,2-DIMETHYLBUTANE		NA	NA		1.6	NA
2,3-DIMETHYLBUTANE		NA	NA		1.4	NA
2-METHYLPENTANE	1.6	NA	NA		4.5	NA
3-METHYLPENTANE		NA	NA	0.4	2.7	NA
ISOPRENE	16.6	NA	NA	1.4	1.9	NA
1-HEXENE		NA	NA	1.4		NA
HEXANE		NA	NA	1.2	3.8	NA
METHYLCYCLOPENTANE		NA	NA		2.3	NA
2,4-DIMETHYLPENTANE		NA	NA			NA
BENZENE	2.1	NA	NA	0.9	3.4	NA
CYCLOHEXANE		NA	NA		0.9	NA
2-METHYLHEXANE		NA	NA		0.6	NA
2,3-DIMETHYLPENTANE		NA	NA			NA
3-METHYLHEXANE		NA	NA	4.1	0.8	NA
2,2,4-TRIMETHYLPENTANE	3.2	NA	NA		2.4	NA
HEPTANE		NA	NA	1.7	1.2	NA
METHYLCYCLOHEXANE	1.0	NA	NA	0.9	0.8	NA
2,3,4-TRIMETHYLPENTANE		NA	NA		0.7	NA
TOLUENE	28.5	NA	NA	4.4	14.5	NA
2-METHYLHEPTANE		NA	NA			NA
3-METHYLHEPTANE		NA	NA			NA
N-OCTANE		NA	NA	1.0	2.6	NA
ETHYLBENZENE		NA	NA	8.1	1.1	NA
M/P-XYLENE		NA	NA	38.2	3.9	NA
STYRENE		NA	NA			NA
O-XYLENE		NA	NA	13.6	1.7	NA
NONANE	0.6	NA	NA			NA
ISOPROPYLBENZENE		NA	NA			NA
N-PROPYLBENZENE		NA	NA	0.5	0.6	NA
M-ETHYLTOLUENE		NA	NA	2.9	1.4	NA
P-ETHYLTOLUENE		NA	NA			NA
1,3,5-TRIMETHYLBENZENE		NA	NA			NA
O-ETHYLTOLUENE		NA	NA			NA
1,2,4-TRIMETHYLBENZENE	9.4	NA	NA	2.9		NA
DECANE		NA	NA			NA
1,2,3-TRIMETHYLBENZENE	1.1	NA	NA	14.6	1.5	NA
M-DIETHYLBENZENE		NA	NA			NA
P-DIETHYLBENZENE		NA	NA			NA
UNDECANE		NA	NA	0.6	4.2	NA
DODECANE		NA	NA	3.8		NA

Total Hydrocarbons	139.3	NA	NA	163.0	174.2	NA
Total NMOC	110.8	NA	NA	133.0	141.2	NA
Unknowns	2.0	NA	NA	8.6	10.1	NA
Known NMOC	108.8	NA	NA	124.4	131.1	NA

Sept 1 1999 Tower Hydrocarbon Samples

	Ground		820 Ft		1420 Ft	
	AM	PM	AM	PM	AM	PM
Methane	26.0	36.0	32.9	31.5	NA	40.8
ETHANE	4.5	2.4	2.3	2.7	NA	2.0
ETHYLENE	1.3	2.1	1.2	1.9	NA	0.8
PROPANE	4.2	2.2	3.1	4.0	NA	2.0
PROPYLENE	0.9		1.3	1.9	NA	0.9
ISOBUTANE	1.7	0.7	1.2	1.0	NA	0.6
BUTANE	2.4	1.1	1.1	1.9	NA	0.9
ACETYLENE	1.5	1.8	4.2	1.5	NA	1.0
TRANS-2-BUTENE					NA	
1-BUTENE				0.5	NA	
CIS-2-BUTENE					NA	
CYCLOPENTANE	1.5				NA	
ISOPENTANE	4.4	2.1	1.9	2.3	NA	1.6
PENTANE	1.3	2.1	1.4	2.1	NA	0.8
TRANS-2-PENTENE					NA	
1-PENTENE				0.3	NA	
CIS-2-PENTENE					NA	
2,2-DIMETHYLBUTANE					NA	
2,3-DIMETHYLBUTANE					NA	
2-METHYLPENTANE	0.8	0.5	0.5	0.6	NA	0.9
3-METHYLPENTANE					NA	
ISOPRENE	4.7	6.9	0.9	1.2	NA	1.0
1-HEXENE			0.5	1.2	NA	
HEXANE	0.8	1.0	1.2	1.4	NA	2.3
METHYLCYCLOPENTANE					NA	
2,4-DIMETHYLPENTANE					NA	
BENZENE	1.1	1.4		1.4	NA	1.5
CYCLOHEXANE					NA	
2-METHYLHEXANE					NA	
2,3-DIMETHYLPENTANE	0.5				NA	
3-METHYLHEXANE	1.0		0.7		NA	
2,2,4-TRIMETHYLPENTANE	1.8	1.3			NA	0.6
HEPTANE				1.4	NA	
METHYLCYCLOHEXANE					NA	
2,3,4-TRIMETHYLPENTANE					NA	
TOLUENE	6.2	24.5	2.2	5.6	NA	7.7
2-METHYLHEPTANE					NA	
3-METHYLHEPTANE					NA	
N-OCTANE	1.7			0.8	NA	2.7
ETHYLBENZENE			1.2	3.6	NA	
M/P-XYLENE	1.5		6.3	16.2	NA	
STYRENE					NA	
O-XYLENE	1.1		2.3	5.6	NA	
NONANE					NA	
ISOPROPYLBENZENE					NA	
N-PROPYLBENZENE			1.2	2.9	NA	
M-ETHYLTOLUENE		1.0	1.4		NA	
P-ETHYLTOLUENE					NA	
1,3,5-TRIMETHYLBENZENE	0.4			2.3	NA	
O-ETHYLTOLUENE					NA	
1,2,4-TRIMETHYLBENZENE	2.4	7.0	3.1		NA	
DECANE	1.9			3.0	NA	
1,2,3-TRIMETHYLBENZENE	1.5	1.2	6.1	11.0	NA	
M-DIETHYLBENZENE					NA	
P-DIETHYLBENZENE	0.7				NA	
UNDECANE	0.6	3.1	0.5	2.6	NA	
DODECANE	0.9			3.7	NA	1.7

Total Hydrocarbons	79.6	100.2	83.9	123.7	0.0	76.8
Total NMOC	53.5	64.2	51.0	92.2	0.0	36.0
Unknowns	0.4	1.9	4	7.4	NA	7.1
Known NMOC	53.1	62.3	47.0	84.8	NA	28.9

Sept 8, 1999 Tower Hydrocarbon Samples

	Ground		820 Ft		1420 Ft	
	AM	PM	AM	PM	AM	PM
Methane	34.8	33.6	NA	33.3	32.7	32.7
ETHANE	4.0	4.5	NA	2.9	3.1	3.4
ETHYLENE	3.9	5.4	NA	2.6	2.0	
PROPANE	8.5	3.3	NA	3.7	2.0	2.8
PROPYLENE	5.4	7.8	NA	1.7	0.5	0.7
ISOBUTANE	1.4	1.4	NA	0.6	0.4	2.4
BUTANE	1.7	1.9	NA	1.1	0.8	4.7
ACETYLENE	1.3	2.4	NA	2.4	1.2	2.4
TRANS-2-BUTENE			NA			
1-BUTENE	0.6	1.0	NA			0.6
CIS-2-BUTENE			NA	0.7		0.4
CYCLOPENTANE			NA		1.3	
ISOPENTANE	4.8	3.4	NA	1.6	0.7	8.7
PENTANE	1.5	1.5	NA	2.2	0.7	3.0
TRANS-2-PENTENE	0.4	0.8	NA			0.9
1-PENTENE	0.8		NA	0.3		0.7
CIS-2-PENTENE			NA		0.6	0.4
2,2-DIMETHYLBUTANE	0.5	0.4	NA			0.5
2,3-DIMETHYLBUTANE	0.4	0.4	NA			0.7
2-METHYLPENTANE	0.9	1.0	NA	0.3		2.7
3-METHYLPENTANE			NA			
ISOPRENE	1.9	15.8	NA	2.3		3.0
1-HEXENE		0.6	NA	0.7		
HEXANE	0.8	0.8	NA	2.1		1.7
METHYLCYCLOPENTANE			NA			0.6
2,4-DIMETHYLPENTANE			NA			
BENZENE	2.3	1.2	NA	1.5	1.7	0.8
CYCLOHEXANE			NA			
2-METHYLHEXANE		1.0	NA			
2,3-DIMETHYLPENTANE			NA			
3-METHYLHEXANE			NA			
2,2,4-TRIMETHYLPENTANE	3.4	5.7	NA	0.5	0.6	0.9
HEPTANE			NA	2.0		
METHYLCYCLOHEXANE		0.8	NA	1.0	1.4	0.6
2,3,4-TRIMETHYLPENTANE		0.7	NA			
TOLUENE	14.8	7.4	NA	5.0	5.7	6.1
2-METHYLHEPTANE			NA		0.8	1.0
3-METHYLHEPTANE			NA			
N-OCTANE			NA	1.6	2.4	2.3
ETHYLBENZENE			NA	3.2		
M/P-XYLENE	1.3	0.9	NA	16.0		
STYRENE			NA			
O-XYLENE		0.8	NA	4.8		
NONANE			NA			
ISOPROPYLBENZENE			NA			
N-PROPYLBENZENE			NA			
M-ETHYLTOLUENE	4.6	1.3	NA	1.9		
P-ETHYLTOLUENE			NA			
1,3,5-TRIMETHYLBENZENE			NA			
O-ETHYLTOLUENE			NA			
1,2,4-TRIMETHYLBENZENE	7.0	5.2	NA	2.7		
DECANE			NA			
1,2,3-TRIMETHYLBENZENE	7.2	2.9	NA	8.1		
M-DIETHYLBENZENE			NA			
P-DIETHYLBENZENE			NA			
UNDECANE	1.5		NA	0.7	4.1	2.2
DODECANE			NA			

Total Hydrocarbons	109.8	115.6	NA	102.6	66.1	91.4
Total NMOC	75.0	82.0	NA	69.4	33.4	58.8
Unknowns	4	4.7	NA	3.9	1.4	6.8
Known NMOC	71.0	77.3	NA	65.5	32.0	52.0

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North Carolina Division of Air Quality  
1641 Mail Service Center  
Raleigh, NC 27699-1641  
919-715-0660  
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