AP-42 Section 11.1
Reference
Report Sect. 4
Reference 45
VOL. I

RAMCON
ENVIRONMENTAL CORPORATION

AIR POLLUTION SOURCE TESTING AT

LEHMAN ROBERTS COMPANY
Memphis, Tennessee

VOLUME I

Submitted to:

LEHMAN ROBERT COMPANY
P.O. Box 666
Memphis, Tennessee 38101

and

NATIONAL ASPHALT PAVEMENT ASSOCIATION
5100 Forbes Boulevard
NAPA Building
Lanham, Maryland 20706-4413

Submitted on:

October 23, 1991

Submitted by:

RAMCON ENVIRONMENTAL CORPORATION
223 Scott Street
Memphis, Tennessee 38112
901/458-7000

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CERTIFICATION

We do hereby certify that the following report has been reviewed and is to the best of our knowledge a true representation of the results. Further, all tests, sampling and analytical methods were performed in accordance with acceptable procedures to the United States Environmental Protection Agency.

G. Sumner Buck, III
President

10-23-91
Date

Wm. Joseph Sewell, II
Chemical Engineer

10/23/91
Date

TABLE OF CONTENTS

I. INTRODUCTION

On September 3 and 4 and October 1, 1991, personnel from RAMCON Environmental Corporation conducted source emissions determinations at Lehman Roberts Asphalt located in Memphis, Tennessee. The testing was conducted according to the National Asphalt Pavement Association (NAPA) guidelines entitled, "Protocol for Air Pollution Source Testing".

The scope of work involved testing this facility for filterable and condensible particulate matter, formaldehyde, and polynuclear aromatic hydrocarbons. These compounds were sampled according to specified isokinetic testing procedures. Also, "real-time" continuous emissions monitor (CEM) instrumentation was utilized to conduct on-site analysis for oxygen, carbon dioxide, total volatile organics, sulfur dioxide, carbon monoxide, and nitrogen oxides. Methane, benzene, toluene, ethyl benzene, and xylene compounds were analyzed on a semi-continuous basis by employing a gas chromatograph to the sampling location.

Additionally, stack gas moisture, velocity, and volumetric flow rates were determined to provide data enabling conversion of flue gas concentrations to emission data. These determinations were conducted in conjunction with each of the isokinetic testing procedures.

Where possible, the testing was conducted simultaneously. This provides correlations of the various stack effluents relationships with one another. Three (3) test runs were conducted for each testing procedure. Each test run was performed for a one hour duration.

The purpose of the testing project was to provide air emissions information for developing a database of information using various types of hot mix asphalt plants.

Mr. Tim Huey, Laboratory Technician of RAMCON Environmental Corporation, was responsible for the particulate laboratory analysis including taring the beakers and filters and recording final data in the laboratory record books. Custody of the particulate samples were limited to Mr. Huey and Mr. Crook . Triangle Laboratories, Inc. of Durham, North Carolina conducted the PAH analysis. American Interplex of Little Rock, Arkansas conducted the formaldehyde analysis.

RAMCON Environmental's testing teams consisted of Ken Allmendinger; Field Supervisor and responsible for calibration of the instruments, Ray Jenkins; responsible for operating the gas chromatograph, Charles Crook; responsible for conducting the PM, CPM and PAH testing, and Billy Lockett; responsible for conducting the formaldehyde testing.

II. TEST RESULTS

Tables I - VI summarize the test results. Tables I & II summarize the instrumental gaseous concentrations and emissions summary. Table III shows the particulate results, Table IV the methane and BTEX concentrations, Table V the PAH results, and Table VI the formaldehyde test summary.

TABLE I
INSTRUMENTAL TEST SUMMARY
GASEOUS CONCENTRATIONS

Run #	THC, ppmd	SO2, ppmd	CO2, %d	CO, ppmd	O2, %d	NOx, ppmd
1	231.3	1.6	7.7	>1,000.0	7.3	45.6
2	252.1	2.3	7.1	>1,000.0	7.9	37.6
3	335.0	2.0	7.1	>1,000.0	7.9	39.3
Avg.	272.8	1.98	7.30	>1,000.0	7.7	40.8

TABLE II
EMISSIONS SUMMARY
LBS/HR

Run	THC as methane	SO2	CO	NOx
1	12.05	0.33	> 91.01	6.82
2	14.77	0.54	>102.33	6.32
3	20.36	0.49	>106.15	6.85
Avg.	15.73	0.45	> 99.83	6.66

TABLE III
PARTICULATE TEST SUMMARY
CONCENTRATION

Run	Particulate Gr/DSCF	Particulate g/DSCM	CPM* gr/DSCF	CPM g/DSCM
1	0.0067	0.0154	0.0024	0.0055
2	0.0142	0.0326	0.0021	0.0048
3	0.0133	0.0305	0.0013	0.0030
Avg.	0.0114	0.0262	0.0019	0.0044

*CPM = Condensible Particulate Matter

PARTICULATE EMISSIONS SUMMARY

Run #	Particulate Lbs/Hr	CPM Lbs/Hr
1	1.37	0.49
2	2.72	0.40
3	2.66	0.26
Avg.	2.25	0.38

TABLE IV
METHANE & BTEX TEST SUMMARY
PPM CONCENTRATIONS

Run #	Methane	Benzene	Toluene	Ethyl Benzene	Xylene(s)
1	11.25	*BDL	BDL	BDL	BDL
2	11.28	0.28	BDL	BDL	BDL
3	37.85	0.69	BDL	BDL	BDL
Avg.	20.13	0.32	BDL	BDL	BDL

*Below Detection Limit

TABLE V
PAH TEST SUMMARY

Run #	Concentration Gr/DSCF	Emissions Lbs/Hr
1	0.000272	0.049
2	0.000245	0.049
3	0.000273	0.057
Avg.	0.000263	0.052

TABLE VI
FORMALDEHYDE TEST SUMMARY

Run #	Concentration Gr/DSCF	Emissions Lbs/Hr
1	0.0029	0.62
2	0.0034	0.71
3	0.0003	0.06
Avg.	0.0022	0.46

III. SAMPLING & ANALYTICAL PROCEDURES

A. Total Particulate - US EPA Reference Method 5:

1. Preparation - All glassware utilized in each sampling train was thoroughly cleaned and dried prior to each test series. A glass fiber filter was used that had been labeled, desiccated for a minimum of 24 hours and pre-weighed.

The impinger system configuration was assembled using the outlined procedure in Method 5. One hundred ml of deionized water was placed in the first two impingers. The third impinger was initially empty and the fourth impinger contained a pre-weighed amount of silica gel for complete moisture removal. In assembling the sample train, a small amount of silicon grease was placed on the ball joints to ensure adequate sealing.

A stainless steel probe liner and nozzle system was utilized for the total particulate determinations. The probe housed a set of calibrated S-type pitot tubes and a calibrated thermocouple for monitoring stack temperature.

2. Sampling - The sample box was heated to an approximate temperature of 250°F. These temperatures were monitored throughout the testing. An ice bath was prepared to submerse the impinger system. The temperature of the last impinger was monitored throughout the testing to ensure adequate condensation of the water vapor in the flue gases.

A leak check was performed prior to each test run. The entire sample train system was subjected to a vacuum that did not exceed 0.02 cfm leakage rate. The vacuum established during the pre-test leak check was not exceeded during the test period.

Three sample runs were conducted at the sampling location to constitute a complete test. The sampling time was a minimum of 1 hour and at least 30 scf of stack gas was extracted via the sampling system.

When a test run was completed, a post-test leak check was conducted prior to any dismantling of the sampling train. Once this was successfully achieved, the sample train was dismantled for sample recovery.

The probe and connecting glassware were washed with acetone. The contents of the impingers were also volumetrically measured for moisture gain and transferred to a labeled sample container. The glass fiber filter was carefully transferred to its sample container.

3. Analysis - The glass fiber filter were desiccated for 24 hours prior to any weighing. The first weighing was performed after this initial period of drying. After a minimum of 6 additional hours of desiccating, a second weighing was conducted. The weights must agree within 0.0005 g. All analysis data was recorded. Sample field blanks of acetone were collected, contained, labeled and analyzed in conjunction with the samples.

B. Determination of Sulfur Dioxide Emissions From Stationary Sources (Instrumental Analyzer Procedure) - US EPA Method 6C:

1. Calibration - The calibration of the instruments was performed using certified gas standards composed of a known concentration of sulfur dioxide in zero grade nitrogen. These gas standards were prepared using partial pressure/volumetric and gravimetric methods.

The prepared gas mixture is analyzed and the certification tolerance is not greater than 2% of the pollutant component. A copy of the analysis certificate for each of the certified gas mixtures used during the testing is included in the test report.

The instrument utilizes an ultraviolet nondispersive infrared detector. The detection limitation is 0.1 ppm. Two test ranges are available according to the sulfur dioxide levels present in the gas stream. A 100 ppm and a 1000 ppm full-scale may be utilized. In this project, the burner was utilizing natural gas as a fuel and subsequent sulfur dioxide levels were very low or non-detectable.

Immediately prior to each compliance test series, a complete calibration of the instrument was performed. Each instrument had zero grade nitrogen injected into it and the zero potentiometer was adjusted, if necessary, until the proper voltage output from the analyzer was achieved.

Then a high range pollutant gas mixture, that has been prepared in the specified range percentage of the span or full-scale, is injected. After the system stabilizes, the span or full-scale potentiometer was adjusted until the voltage output from analyzer corresponds to the certification of analysis for the respective calibration gas.

When this procedure is complete and the system has responded properly to a zero and full-scale reading, a mid range certified calibration gas is injected into the system. No adjustments are made to the system except to achieve proper flow rate through the analyzer. The analyzer, after reaching a stable value, must correspond to the certified value of the calibration gas within a specified percentage of the full-scale.

This mid range calibration gas serves two purposes of quality control and quality assurance. The first is to show the instrument analyzes and outputs data on a linear scale. The second purpose is to validate that the zero and full-scale values of the instrument are properly set.

2. Sampling - After calibration, the system is purged with zero grade nitrogen to remove any pollutants that were injected as calibration gas. Once the system indicates that the pollutant gases have been removed, the calibration valve assembly is positioned to allow stack gas to flow through the instrument.

The sample gas is filtered at the stack position to remove any particulate matter. This prevents instruments from being contaminated and ensures reliable data acquisition.

All samples injected to the instruments are removed from the stack and delivered to the instruments via a heated probe and sample line. This prevents any condensation of water vapor and/or pollutant in the gas stream.

Three test runs were conducted to determine the concentration levels of sulfur dioxide. The test runs were conducted over a period of one hour.

To demonstrate the instrument did not exhibit any deviation from the calibrated values set at the beginning of a test period, a sample of certified calibration gas is injected into the sampling system at the conclusion of each test run. The sample system must respond within specified tolerance limits according to the initial system bias check.

This post-test calibration serves two purposes: 1) it demonstrates that excessive calibration drift of the instrument(s) did not occur during the test period and, 2) that the system was not contaminated with any foreign material from the source to alter any results during the test period.

C. Determination of Nitrogen Oxides Emissions From Stationary Sources (Instrumental Analyzer Procedure) - US EPA Method 7E:

1. Calibration - The calibration of the instruments was performed using certified gas standards composed of a known concentration of nitrogen oxide in zero grade nitrogen. These gas standards were prepared using partial pressure/volumetric and gravimetric methods.

The prepared gas mixture is analyzed and the certification tolerance is not greater than 2% of the pollutant component. A copy of the analysis certificate for each of the certified gas mixtures used during the testing is included in the test report.

The instrument utilizes a chemiluminscent detector. The detection limitation of the analyzer is 0.1 ppm. Multiple full-scale ranges are available for operation. A 250, 1000, 2500, and 10,000 ppm full-scale may be selected according to the concentrations of NO_x present in the gas steam. The concentrations encountered at the Lehman Roberts hot mix facility were such that the 250 ppm scale was sufficient for bracketing the concentrations.

The initial calibration of the instruments was performed as previously mentioned in the sulfur dioxide section. A zero nitrogen and a high range calibration gas is utilized to set the instrument potentiometers for proper output.

2. Sampling - After calibration, the system is purged with zero grade nitrogen to remove any pollutants that were injected as calibration gas. Once the system indicates that the pollutant gases have been removed, the calibration valve assembly is positioned to allow stack gas to flow through the instrument.

Three test runs were conducted to determine the NO_x concentrations in the gas stream. Each test run will be conducted over a period of one hour.

To demonstrate that the instrument did not exhibit any deviation from the calibrated values set at the beginning of a test period, a sample of certified calibration gas is injected into the sampling system at the conclusion of each test run as in the sulfur dioxide testing. The sample system must respond within specified tolerance limits according to the initial system bias check.

D. Determination of Carbon Monoxide Emissions From Stationary Sources (Instrumental Analyzer Procedure) - US EPA Method 10:

1. Calibration - The calibration of the instruments is performed using certified gas standards composed of a known concentration of carbon monoxide in zero grade nitrogen. These gas standards are prepared using partial pressure/volumetric and gravimetric methods.

The prepared gas mixture is analyzed and the certification tolerance is not greater than 2% of the pollutant component. A copy of the analysis certificate for each of the certified gas mixtures used during the testing is included in the test report.

The instrument utilizes a Luft-type nondispersive infrared detector. The detection limitation of the analyzer is 0.1 ppm. Two full-scale ranges are available on the analyzer. A 500 ppm and a 1000 ppm full-scale may be utilized. The carbon monoxide levels encountered were analyzed using the 1000 ppm scale.

The initial calibration of the instrument is according to the procedure outlined above. Method 10, however, utilizes an additional calibration mixture for the calibration. A low level calibration gas is required in conjunction with the high and mid level calibration standards.

2. Sampling - Three (3) test runs were conducted to determine the emission value of CO. Each test run was conducted over a period of 1 hour .

To demonstrate that the instrument did not exhibit any deviation from the calibrated values set at the beginning of a test period, a sample of certified calibration gas is injected into the sampling system at the conclusion of each test run. The sample system must respond within specified tolerance limits according to the initial system bias check.

E. Determination of Gaseous Organic Emissions From Stationary Sources By Gas Chromatography - US EPA Method 18:

This procedure utilizes the technology of gas chromatography to separate, identify, and quantify various volatile organic compounds that co-exist in a flue gas stream. In this testing project, methane and the BTEX compounds were targeted.

The gas chromatograph was first conditioned in the laboratory where ideal conditions exist for this initial calibration. This consists of conditioning the column, if necessary, and creating calibration curves based on actual data from the GC with known concentration standards. As required by EPA, three (3) standards of known concentration were used in creating the calibration curves. The concentrations of the standards bracketed the expected concentration of pollutant at the source level.

A field calibration check was performed prior to introducing any sample into the gas chromatograph. This is performed by injecting one of the known standards into the GC and comparing the result to the calibration curve. It must agree within 5% of the previously determined response.

Analysis of the samples follow a successful field calibration. Collecting the sample consisted of extracting the sample from the stack via a heated sample line. The sample was introduced directly into the sample loop, where it was injected to the instrument for analysis.

Three test runs were performed to determine the values of the specified organic compounds. Each test run consisted of semi-continuously analyzing the gas stream for a one hour period.

F. <u>Determination of Total Gaseous Organic Emissions From Stationary Sources (Instrumental Analyzer Procedure) - US EPA Method 25A:</u>

1. <u>Calibration</u> - The calibration of the instruments is performed using certified gas standards composed of a known concentration of methane in zero grade nitrogen. These gas standards are prepared using partial pressure/volumetric and gravimetric methods.

The prepared gas mixture is analyzed and the certification tolerance is not greater than 2% of the pollutant component. A copy of the analysis certificate for each of the certified gas mixtures used during the testing is included in the test report.

The instrument utilizes an flame ionization detector. The minimum detection limit of the analyzer is 0.1 ppm. Full-scale ranges are available in 100 ppm, 1000 ppm, and 10,000 ppm settings according to the expected concentrations in the flue gas steam. The total organic hydrocarbon concentrations encountered during the testing project enabled the 1000 ppm scale to be used.

As previously mentioned in the carbon monoxide procedure, a low level concentration is employed in conjunction with the high and mid range standards.

2. Sampling - Three test runs were conducted to determine the concentration levels of total organic compounds in the gas stream. Each test run was one hour in duration.

F. Polynuclear Aromatic Hydrocarbons - Method SW846 8270 "Semivolatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS): Capillary Column Technique

1. Preparation - All glassware utilized in each sampling train was thoroughly cleaned with hot soapy water and dried prior to each test series. All residue silicon grease was removed from glassware upstream of the absorbent module. A glass fiber filter was used that has been properly labeled.

The absorbent traps was packed by the analytical laboratory that conducted the final analysis. The impinger system was assembled using 100 ml of D.I. water in impingers 1 and 2. The third impinger was initially empty and the fourth impinger contained silica gel.

In assembling the sample train, teflon tape was placed on the ball joints to ensure adequate sealing upstream of the absorbent module. All connections downstream of the module were sealed with silicon grease.

A glass probe liner and nozzle system was utilized for the collection train. The probe housed a set of calibrated S-type pitot tubes and a calibrated thermocouple for monitoring stack temperature.

2. Sampling - The probe and sample box was heated to an approximate temperature of 250°F. These temperatures were monitored throughout the testing. The probe was connected to the heated filter system with connecting glassware. This filter system was connected to the condenser by a teflon line. The condenser and absorbent module are directly connected via ground glass ball and socket.

An ice bath was prepared to submerse the impinger system into. The temperature of the last impinger was monitored throughout the testing to ensure adequate condensation of the water vapor in the flue gases.

The condenser cooling fluid was recirculated through the system by a veristaltic pump. This pump was started prior to the start up of the sampling system to ensure that the temperature of the absorbent material in the module does not exceed its thermal decomposition temperature. The temperature of gas entering the module was monitored to ensure that the temperature did not exceed the recommended limitation for efficient capture.

A leak check was performed prior to each test run. The entire sample train system was subjected to a vacuum that did not exceed 0.02 cfm leakage rate. The vacuum that was established during the pre-test leak check was not exceeded during the test period.

Three sample runs were conducted to constitute a complete test. The sample time was a minimum of one hour. When a test run was completed, a post-test leak check was conducted prior to any dismantling of the sampling train. Once this had been successfully achieved, the sample train was dismantled for sample recovery.

3. Sample Analysis - Method 8270 is used to determine the concentration of semivolatile organic compounds in extracts prepared from all types of solid waste matrices. Each compound present in the sample is separated by gas chromatography and quantified by mass spectrometry. The detection limitation of this type of sample has been determined to be 1.0 microgram.

If the samples are separated for further analysis, the detection limit will be 2.0 micrograms.

G. EPA Draft Method 202, "Determination of Filterable and Condensible Particulate Matter":

The testing procedures were conducted according to US EPA Reference Method 5 for particulate matter determination. This testing procedure was covered in a previous section. The filterable portion of the particulate matter was determined via this procedure. The condensible fraction of the sample was determined by analyzing the back half impinger catch with a methylene chloride extraction.

This extraction procedure will yield fractions of inorganic and organic condensible matter. The concentrations and emission values of both filterable particulate and condensible particulate matter have been summarized in the test results section.

H. EPA Draft Method 0011, "Determination of Formaldehyde":

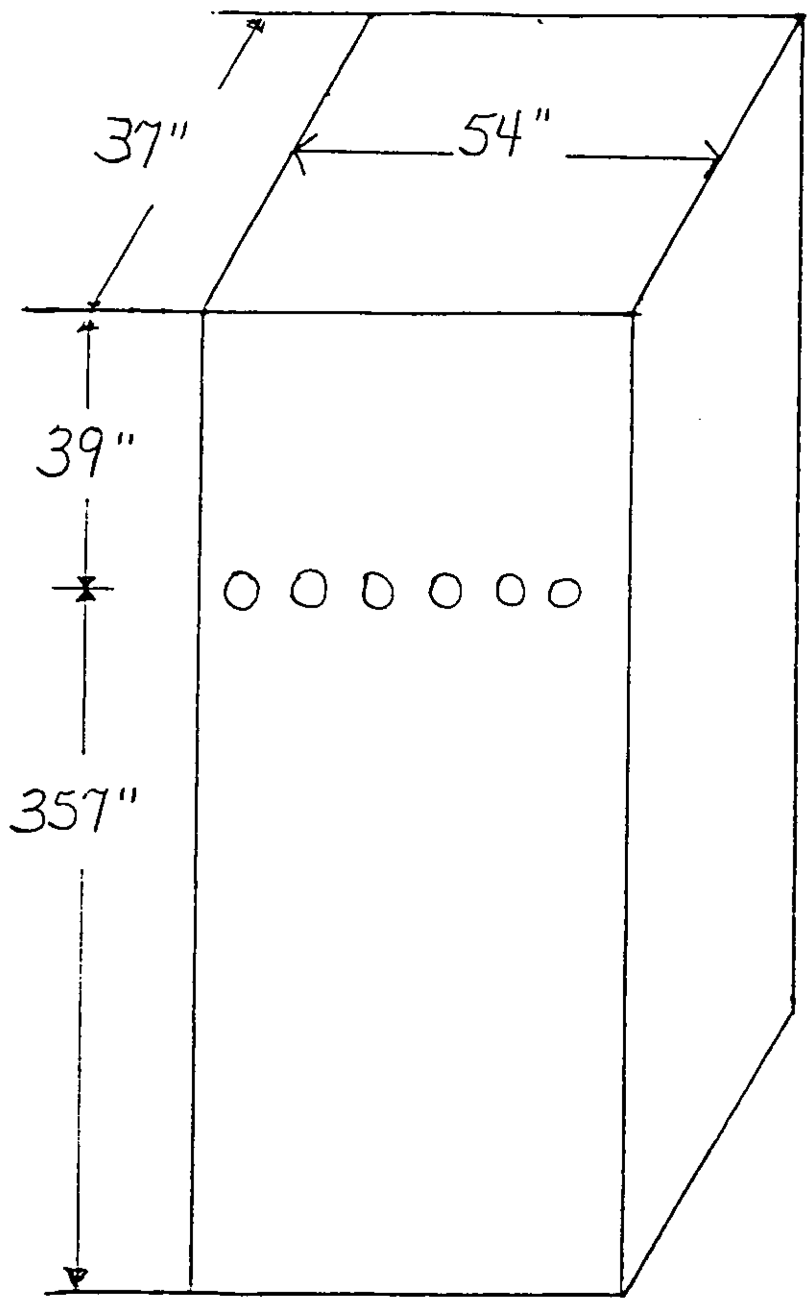
This sampling procedure is similar to the operational procedures found in Reference Method 5. Described in this section are the differences set forth from Method 5 to ensure that the integrity of the formaldehyde sample is maintained.

Prior to any sampling, all glassware was rinsed with methylene chloride to remove any contamination initially on the glassware such as stopcock grease. This includes the rinsing of the glass probe liner material required for the collection of the sample.

In collecting the sample, a minimum of 45 cubic feet must be pulled isokinetically such that the extracted sample is transferred through the DNPH absorption solution. All samples were placed into glass amber sample containers to avoid the alteration of the sample by sunlight.

The analysis of the formaldehyde samples were conducted according to the procedures outlined in Method 8315. This analysis procedure provides guidance in the evaluation of formaldehyde samples by High Performance Liquid Chromatography (HPLC).

Sampling Site: The emissions test was conducted after a baghouse on a rectangular stack measuring 37.0" x 54.0" with an equivalent diameter of 43.9". Six sampling ports were placed 39" down (0.9 diameters upstream) from the top of the stack and 357" up (8.1 diameters downstream) from the last flow disturbance. The ports were evenly spaced on 9.0" centers. The two outside ports are 4.5" from the side walls of the stack. The gaseous samples were taken from an additional sample port located 50" below the original sample ports and located in the center of the stack.



IV. THE SOURCE

Lehman Roberts employs an Standard Havens drum mix asphalt plant which is used to manufacture hot mix asphalt for road pavement. The process consists of blending prescribed portions of cold feed materials (sand, gravel, screenings, chips, etc.) uniformly and adding sufficient hot asphalt oil to bind the mixture together. After the hot asphalt mix is manufactured at the plant, it is transported to the location where it is to be applied. The hot asphalt mix is spread evenly over the surface with a paver then compacted with a heavy roller to produce the final product.

The following is a general description of the plant's manufacturing process: The cold feed materials (aggregate) are dumped into separate bins which in turn feed a common continuous conveyor. The aggregate is dispensed from the bins in accordance with the desired formulation onto the cold feed system conveyor, to an inclined weigh conveyor, then to a rotating drum for continuous mixing and drying at approximately 300°F. When recycled asphalt mix is used, it is added halfway down the drum through a separate conveyor. The required amount of hot asphalt oil is then injected onto and mixed into the dried aggregate. The now newly formed hot asphalt mix is pulled to the top of a storage silo by a conveyor. The hot asphalt mix is then discharged from the storage silo through a slide gate into waiting dump trucks which transports the material to a final destination for spreading. The rated capacity of the plant will vary with each aggregate mix and moisture content with a 5% surface moisture removal.

The drum mixer uses a burner fired with fuel to heat air to dry the aggregate, and the motion of the rotating drum to blend the aggregate. The air is drawn into the system via an exhaust fan. After passing through the gas burner and the mixing drum, the air passes through a baghouse. The exhaust gasses are drawn through the baghouse and discharged to the atmosphere through the stack. The design pressure drop across the tube sheet is 2-6 inches of water. The particulate matter, which is removed by the baghouse, is reinjected into the drum mixer.

Condensible
Run #1

```
***********************************************************************
*                                                                     *
*                        Lehman - Roberts                             *
*        09-04-91                                        09:48:12     *
*                      Plant Status Report                            *
*                                                                     *
***********************************************************************
*                 Rate   Units                  Total    Units        *
* ------------------------------------------------------------        *
* Production      394   Tons Per Hour          737    Tons            *
* Aggregate       319   Tons Per Hour          625.9  Tons            *
* Total  A.C.     20.9  Tons Per Hour                                 *
* Virgin A.C.     18.7  Tons Per Hour           30.68 Tons            *
*                                                                     *
* R.A.P.  A.C.     2.2  Tons Per Hour                                 *
*                                                                     *
* R.A.P.           54   Tons Per Hour           81.1  Tons            *
*                                                                     *
*                                                                     *
* Additive          0   Lbs  Per Hour                                 *
*                                   Agg. Composite Moisture   4.6 %  *
*                                                                     *
*   Mix   Temperature    304 Deg.   Sling. Position    19 %           *
*   A.C.  Temperature    312 Deg.   Burner Position    69 %           *
*                                   Damper Position    78 %           *
*   Stack  Temperature   278 Deg.                                     *
*                                   B/H Pulse Time     15    Seconds *
*   Instant Actual A.C.  5.30 %     Negative  Press    0.15 Inches   *
*   Average Actual A.C.  5.26 %     B/H Diff. Press    4.2  Inches   *
***********************************************************************
*                                                                     *
*          Running Mix # 51                                           *
*               Name : 411-E                                          *
*          Description : 411-E/W RAP AC IN RAP 3.5%                   *
*          -------------------------------------------------------    *
*   Feeder # 1    9.5 Mix %     3.4 Moist %   A.C.   On  Time  245 Sec *
*   Feeder # 2    0.0 Mix %     2.5 Moist %   A.C.   Off Time  200 Sec *
*   Feeder # 3    6.6 Mix %    15.7 Moist %                           *
*   Feeder # 4    0.0 Mix %    13.7 Moist %                           *
*   Feeder # 5    0.0 Mix %     2.7 Moist %                           *
*   Feeder # 6   36.0 Mix %     2.6 Moist %   Mix Temp Set    320 Deg *
*   Feeder # 7   28.4 Mix %     4.9 Moist %                           *
*                                                                     *
*   R.A.P.       14.2 Mix %     7.5 Moist %    4.0 A.C. %             *
*                                                                     *
*   A.C.          5.3 Mix %                                           *
*                                                                     *
*                                                                     *
*               ------                                                *
*     Total     100.0 %                     Additive   0.00 Mix %     *
*                                                                     *
*                                                                     *
***********************************************************************
```

09-04-91 09:52:10 Feeder MAX TPH Calibration Error

```
***************************************************************************
*                                                                         *
*                              Lehman - Roberts                           *
*         09-04-91                                         09:58:10       *
*                            Plant Status Report                          *
*                                                                         *
***************************************************************************
*                   Rate   Units                     Total    Units       *
* ----------------------------------------------------------------        *
* Production         391   Tons Per Hour              806     Tons        *
* Aggregate          311   Tons Per Hour              680.2   Tons        *
* Total  A.C.       20.9   Tons Per Hour                                  *
* Virgin A.C.       18.5   Tons Per Hour              33.81   Tons        *
*                                                                         *
* R.A.P.  A.C.       2.4   Tons Per Hour                                  *
*                                                                         *
* R.A.P.            59     Tons Per Hour              93.7    Tons        *
*                                                                         *
*                                                                         *
* Additive           0     Lbs  Per Hour                                  *
*                                        Agg. Composite Moisture   4.6 %  *
*                                                                         *
*   Mix     Temperature   313 Deg.       Sling. Position    19 %          *
*   A.C.    Temperature   313 Deg.       Burner Position    68 %          *
*                                        Damper Position    77 %          *
*   Stack   Temperature   283 Deg.                                        *
*                                        B/H Pulse Time     15    Seconds *
*   Instant Actual A.C.   5.35 %         Negative  Press    0.15  Inches  *
*   Average Actual A.C.   5.29 %         B/H Diff. Press    4.3   Inches  *
***************************************************************************
*                                                                         *
*           Running Mix # 51                                              *
*                 Name : 411-E                                            *
*           Description : 411-E/W RAP AC IN RAP 3.5%                      *
*         ----------------------------------------------------            *
*  Feeder # 1    9.5 Mix %     3.4 Moist %    A.C.    On  Time  245 Sec   *
*  Feeder # 2    0.0 Mix %     2.5 Moist %    A.C.    Off Time  200 Sec   *
*  Feeder # 3    6.6 Mix %    15.7 Moist %                                *
*  Feeder # 4    0.0 Mix %    13.7 Moist %                                *
*  Feeder # 5    0.0 Mix %     2.7 Moist %                                *
*  Feeder # 6   36.0 Mix %     2.6 Moist %    Mix Temp Set      320 Deg   *
*  Feeder # 7   28.4 Mix %     4.9 Moist %                                *
*                                                                         *
*  R.A.P.       14.2 Mix %     7.5 Moist %      4.0 A.C. %                *
*                                                                         *
*  A.C.          5.3 Mix %                                                *
*                                                                         *
*                                                                         *
*             ------                                                      *
*     Total   100.0 %                        Additive  0.00 Mix %         *
*                                                                         *
*                                                                         *
***************************************************************************
```

Lehman - Roberts

09-04-91 10:08:12

Plant Status Report

	Rate	Units	Total	Units
Production	396	Tons Per Hour	877	Tons
Aggregate	318	Tons Per Hour	733.7	Tons
Total A.C.	21.4	Tons Per Hour		
Virgin A.C.	19.1	Tons Per Hour	36.96	Tons
R.A.P. A.C.	2.3	Tons Per Hour		
R.A.P.	57	Tons Per Hour	106.7	Tons
Additive	0	Lbs Per Hour		

Agg. Composite Moisture 4.6 %

Mix Temperature	301 Deg.	Sling. Position	19 %
A.C. Temperature	313 Deg.	Burner Position	73 %
		Damper Position	82 %
Stack Temperature	285 Deg.		
		B/H Pulse Time	15 Seconds
Instant Actual A.C.	5.40 %	Negative Press	0.14 Inches
Average Actual A.C.	5.29 %	B/H Diff. Press	4.5 Inches

Running Mix # 51

Name : 411-E

Description : 411-E/W RAP AC IN RAP 3.5%

Feeder # 1	9.5 Mix %	3.4 Moist %	A.C. On Time 245 Sec
Feeder # 2	0.0 Mix %	2.5 Moist %	A.C. Off Time 200 Sec
Feeder # 3	6.6 Mix %	15.7 Moist %	
Feeder # 4	0.0 Mix %	13.7 Moist %	
Feeder # 5	0.0 Mix %	2.7 Moist %	
Feeder # 6	36.0 Mix %	2.6 Moist %	Mix Temp Set 320 Deg
Feeder # 7	28.4 Mix %	4.9 Moist %	
R.A.P.	14.2 Mix %	7.5 Moist %	4.0 A.C. %
A.C.	5.3 Mix %		
Total	100.0 %		Additive 0.00 Mix %

Lehman - Roberts

09-04-91 10:18:11

Plant Status Report

	Rate	Units	Total	Units
Production	399	Tons Per Hour	946	Tons
Aggregate	323	Tons Per Hour	787.0	Tons
Total A.C.	21.1	Tons Per Hour		
Virgin A.C.	18.9	Tons Per Hour	40.09	Tons
R.A.P. A.C.	2.3	Tons Per Hour		
R.A.P.	55	Tons Per Hour	119.5	Tons
Additive	0	Lbs Per Hour		

Agg. Composite Moisture 4.6 %

Mix Temperature 303 Deg.	Sling. Position	19 %
A.C. Temperature 314 Deg.	Burner Position	78 %
	Damper Position	84 %
Stack Temperature 287 Deg.		
	B/H Pulse Time	15 Seconds
Instant Actual A.C. 5.28 %	Negative Press	0.15 Inches
Average Actual A.C. 5.29 %	B/H Diff. Press	4.6 Inches

Running Mix # 51
Name : 411-E
Description : 411-E/W RAP AC IN RAP 3.5%

Feeder # 1	9.5 Mix %	3.4 Moist %	A.C. On Time	245 Sec
Feeder # 2	0.0 Mix %	2.5 Moist %	A.C. Off Time	200 Sec
Feeder # 3	6.6 Mix %	15.7 Moist %		
Feeder # 4	0.0 Mix %	13.7 Moist %		
Feeder # 5	0.0 Mix %	2.7 Moist %		
Feeder # 6	36.0 Mix %	2.6 Moist %	Mix Temp Set	320 Deg
Feeder # 7	28.4 Mix %	4.9 Moist %		
R.A.P.	14.2 Mix %	7.5 Moist %	4.0 A.C. %	
A.C.	5.3 Mix %			
Total	100.0 %		Additive	0.00 Mix %

Lehman - Roberts

09-04-91 10:23:15

Change to New Mix

```
*                    Name : 307-A                                                  *
*             Description : 307-A LIMESTONE                                        *
*  ------------------------------------------------------------------------------  *
*  Feeder # 1   28.9 Mix %    3.4 Moist %   A.C.     On  Time  215 Sec             *
*  Feeder # 2   36.6 Mix %    2.5 Moist %   A.C.     Off Time  200 Sec             *
*  Feeder # 3    0.0 Mix %   15.7 Moist %                                          *
*  Feeder # 4    0.0 Mix %   13.7 Moist %                                          *
*  Feeder # 5   30.9 Mix %    2.7 Moist %                                          *
*  Feeder # 6    0.0 Mix %    2.6 Moist %   Mix Temp Set        300 Deg            *
*  Feeder # 7    0.0 Mix %    4.9 Moist %                                          *
*                                                                                  *
*  R.A.P.        0.0 Mix %    7.5 Moist %      4.0 A.C. %                          *
*                                                                                  *
*  A.C.          3.6 Mix %                                                         *
*                                                                                  *
*                                                                                  *
*             ------                                                               *
*     Total    100.0 %                      Additive   0.00 Mix %                  *
*                                                                                  *
*                                                                                  *
************************************************************************************


        09-04-91  10:23:18  Change Mix On


        09-04-91  10:26:17  Bin #1 High


        09-04-91  10:27:57  Asphalt Deviation


************************************************************************************
*                                                                                  *
*                            Lehman - Roberts                                      *
*        09-04-91                                                10:28:11          *
*                          Plant Status Report                                     *
*                                                                                  *
************************************************************************************
*               Rate  Units                    Total    Units                      *
*  ---------------------------------------------------------------                 *
* Production     410  Tons Per Hour            1020     Tons                       *
* Aggregate      396  Tons Per Hour           844.8     Tons                       *
* Total  A.C.   14.1  Tons Per Hour                                                *
* Virgin A.C.   14.1  Tons Per Hour           43.06     Tons                       *
*                                                                                  *
* R.A.P.  A.C.   0.0  Tons Per Hour                                                *
*                                                                                  *
* R.A.P.           0  Tons Per Hour           132.0     Tons                       *
*                                                                                  *
*                                                                                  *
```

```
                                       Agg. Composite Moisture  [illegible] %  *
*                                                                      *
*   Mix      Temperature   272 Deg.    Sling. Position     19 %        *
*   A.C.     Temperature   314 Deg.    Burner Position     27 %        *
*                                      Damper Position     54 %        *
*   Stack    Temperature   292 Deg.                                    *
*                                      B/H Pulse Time      15  Seconds *
*   Instant Actual A.C.    3.43 %      Negative  Press    0.19 Inches  *
*   Average Actual A.C.    5.00 %      B/H Diff. Press     3.3 Inches  *
************************************************************************
*                                                                      *
*          Running Mix # 4                                             *
*                Name : 307-A                                          *
*          Description : 307-A LIMESTONE                               *
*          ----------------------------------------------------------  *
*  Feeder # 1  28.9 Mix %    3.4 Moist %   A.C.   On  Time  215 Sec    *
*  Feeder # 2  36.6 Mix %    2.5 Moist %   A.C.   Off Time  200 Sec    *
*  Feeder # 3   0.0 Mix %   15.7 Moist %                               *
*  Feeder # 4   0.0 Mix %   13.7 Moist %                               *
*  Feeder # 5  30.9 Mix %    2.7 Moist %                               *
*  Feeder # 6   0.0 Mix %    2.6 Moist %   Mix Temp Set     300 Deg    *
*  Feeder # 7   0.0 Mix %    4.9 Moist %                               *
*                                                                      *
*  R.A.P.       0.0 Mix %    7.5 Moist %      4.0 A.C. %               *
*                                                                      *
*  A.C.         3.6 Mix %                                              *
*                                                                      *
*                                                                      *
*             ------                                                   *
*     Total   100.0 %                      Additive   0.00 Mix %       *
*                                                                      *
*                                                                      *
************************************************************************




      09-04-91  10:28:16  Change Mix Complete



      09-04-91  10:28:35  Bin #1 High



************************************************************************
*                                                                      *
*                          Lehman - Roberts                            *
*     09-04-91                                           10:38:10      *
*                        Plant Status Report                           *
*                                                                      *
************************************************************************
*             Rate   Units                   Total    Units            *
*  -------------------------------------------------------------       *
* Production    397   Tons Per Hour          1087    Tons              *
* Aggregate     383   Tons Per Hour         909.2    Tons              *
* Total  A.C.  14.2   Tons Per Hour                                    *
* Virgin A.C.  14.2   Tons Per Hour         45.47    Tons              *
*                                                                      *
```

```
* R.A.P.            0    Tons Per Hour          132.0  Tons                *
*
*
* Additive          0    Lbs  Per Hour                                      *
*                                  Agg. Composite Moisture    2.8 %  *
*                                                                           *
*   Mix     Temperature   310 Deg.    Sling. Position    19 %               *
*   A.C.    Temperature   315 Deg.    Burner Position    26 %               *
*                                     Damper Position    46 %               *
*   Stack   Temperature   260 Deg.                                          *
*                                     B/H Pulse Time     15    Seconds *
*   Instant Actual A.C.   3.57 %      Negative  Press    0.16 Inches   *
*   Average Actual A.C.   3.59 %      B/H Diff. Press    1.7  Inches   *
***************************************************************************
*                                                                         *
*          Running Mix # 4                                                *
*                    Name : 307-A                                         *
*           Description : 307-A LIMESTONE                                 *
*          ---------------------------------------------------------      *
*  Feeder # 1  28.9 Mix %    3.4 Moist %   A.C.   On  Time  215 Sec  *
*  Feeder # 2  36.6 Mix %    2.5 Moist %   A.C.   Off Time  200 Sec  *
*  Feeder # 3   0.0 Mix %   15.7 Moist %                                  *
*  Feeder # 4   0.0 Mix %   13.7 Moist %                                  *
*  Feeder # 5  30.9 Mix %    2.7 Moist %                                  *
*  Feeder # 6   0.0 Mix %    2.6 Moist %   Mix Temp Set     300 Deg  *
*  Feeder # 7   0.0 Mix %    4.9 Moist %                                  *
*                                                                         *
*  R.A.P.       0.0 Mix %    7.5 Moist %     4.0 A.C. %                   *
*                                                                         *
*  A.C.         3.6 Mix %                                                 *
*                                                                         *
*                                                                         *
*             ------                                                      *
*     Total   100.0 %                      Additive   0.00 Mix %          *
*                                                                         *
*                                                                         *
***************************************************************************




***************************************************************************
*                                                                         *
*                          Lehman - Roberts                               *
*          09-04-91                                        10:38:42       *
*                         Change to New Mix                               *
*                                                                         *
***************************************************************************
*                                                                         *
*          Running Mix # 51                                               *
*                    Name : 411-E                                         *
*           Description : 411-E/W RAP AC IN RAP 3.5%                      *
*          ---------------------------------------------------------      *
*  Feeder # 1   9.5 Mix %    3.4 Moist %   A.C.   On  Time  245 Sec  *
*  Feeder # 2   0.0 Mix %    2.5 Moist %   A.C.   Off Time  200 Sec  *
*  Feeder # 3   6.6 Mix %   15.7 Moist %                                  *
*  Feeder # 4   0.0 Mix %   13.7 Moist %                                  *
*  Feeder # 5   0.0 Mix %    2.7 Moist %                                  *
*  Feeder # 6  36.0 Mix %    2.6 Moist %   Mix Temp Set     320 Deg  *
*  Feeder # 7  28.4 Mix %    4.9 Moist %                                  *
*                                                                         *
*  R.A.P.      14.2 Mix %    7.5 Moist %     4.0 A.C. %                   *
```

* A.C. 0.0 Mix % *
*
*
* ------
* Total 100.0 % Additive 0.00 Mix % *
*
*
****

09-04-91 10:38:44 Change Mix On

09-04-91 10:43:06 RAP Crusher High Amperage

09-04-91 10:43:18 Recycle Deviation

09-04-91 10:43:32 Asphalt Deviation

09-04-91 10:43:40 Change Mix Complete

09-04-91 10:43:51 Asphalt Deviation

****
*
* Lehman - Roberts *
* 09-04-91 10:48:10 *
* Plant Status Report *
*
****

	Rate	Units	Total	Units
Production	378	Tons Per Hour	1149	Tons
Aggregate	309	Tons Per Hour	964.3	Tons
Total A.C.	20.2	Tons Per Hour		
Virgin A.C.	18.2	Tons Per Hour	48.33	Tons
R.A.P. A.C.	2.0	Tons Per Hour		

```
*
*
* Additive          0   Lbs  Per Hour                                      *
*                                      Agg. Composite Moisture    4.6 %    *
*
*   Mix       Temperature    306 Deg.    Sling. Position     19 %           *
*   A.C.      Temperature    316 Deg.    Burner Position     68 %           *
*                                        Damper Position     68 %           *
*   Stack     Temperature    269 Deg.                                       *
*                                        B/H Pulse Time      15    Seconds  *
*   Instant Actual A.C.      5.34 %      Negative Press     0.14  Inches   *
*   Average Actual A.C.      4.64 %      B/H Diff. Press     3.2  Inches   *
***************************************************************************
*                                                                         *
*              Running Mix # 51                                           *
*                     Name : 411-E                                        *
*              Description : 411-E/W RAP AC IN RAP 3.5%                   *
*              -----------------------------------------------------------*
*  Feeder # 1    9.5 Mix %     3.4 Moist %   A.C.   On  Time   245 Sec    *
*  Feeder # 2    0.0 Mix %     2.5 Moist %   A.C.   Off Time   200 Sec    *
*  Feeder # 3    6.6 Mix %    15.7 Moist %                                *
*  Feeder # 4    0.0 Mix %    13.7 Moist %                                *
*  Feeder # 5    0.0 Mix %     2.7 Moist %                                *
*  Feeder # 6   36.0 Mix %     2.6 Moist %   Mix Temp Set       320 Deg   *
*  Feeder # 7   28.4 Mix %     4.9 Moist %                                *
*                                                                         *
*  R.A.P.       14.2 Mix %     7.5 Moist %     4.0 A.C. %                 *
*                                                                         *
*  A.C.          5.3 Mix %                                                *
*                                                                         *
*                                                                         *
*                 ------                                                  *
*     Total     100.0 %                      Additive   0.00 Mix %        *
*                                                                         *
*                                                                         *
***************************************************************************


***************************************************************************
*                                                                         *
*                                Lehman - Roberts                         *
*          09-04-91                                          10:58:11     *
*                              Plant Status Report                        *
*                                                                         *
***************************************************************************
*                   Rate   Units                    Total    Units        *
*  -----------------------------------------------------------------------*
* Production        406   Tons Per Hour             1219     Tons         *
* Aggregate         323   Tons Per Hour             1018.0   Tons         *
* Total  A.C.      21.5   Tons Per Hour                                   *
* Virgin A.C.      19.0   Tons Per Hour             51.46 Tons            *
*                                                                         *
* R.A.P.  A.C.      2.5   Tons Per Hour                                   *
*                                                                         *
* R.A.P.            61    Tons Per Hour             149.8    Tons         *
*                                                                         *
*                                                                         *
* Additive           0    Lbs  Per Hour                                   *
*                                       Agg. Composite Moisture  4.6 %    *
*
```

```
*   A.C.    Temperature   316 Deg.      Burner Position    82 %        *
*                                       Damper Position    80 %        *
*   Stack   Temperature   282 Deg.                                     *
*                                       B/H Pulse Time     15   Seconds *
*   Instant Actual A.C.    5.29 %       Negative Press    0.16  Inches *
*   Average Actual A.C.    5.29 %       B/H Diff. Press    4.2  Inches *
************************************************************************
*                                                                      *
*             Running Mix # 51                                         *
*                    Name : 411-E                                      *
*             Description : 411-E/W RAP AC IN RAP 3.5%                 *
*             -------------------------------------------------------- *
*  Feeder # 1   9.5 Mix %    3.4 Moist %   A.C.   On  Time  245 Sec    *
*  Feeder # 2   0.0 Mix %    2.5 Moist %   A.C.   Off Time  200 Sec    *
*  Feeder # 3   6.6 Mix %   15.7 Moist %                               *
*  Feeder # 4   0.0 Mix %   13.7 Moist %                               *
*  Feeder # 5   0.0 Mix %    2.7 Moist %                               *
*  Feeder # 6  36.0 Mix %    2.6 Moist %   Mix Temp Set      320 Deg   *
*  Feeder # 7  28.4 Mix %    4.9 Moist %                               *
*                                                                      *
*  R.A.P.      14.2 Mix %    7.5 Moist %     4.0 A.C. %                *
*                                                                      *
*  A.C.         5.3 Mix %                                              *
*                                                                      *
*                                                                      *
*             ------                                                   *
*    Total    100.0 %                      Additive   0.00 Mix %       *
*                                                                      *
*                                                                      *
************************************************************************


************************************************************************
*                                                                      *
*                            Lehman - Roberts                          *
*          09-04-91                                        10:58:36    *
*                          Plant Status Report                         *
*                                                                      *
************************************************************************
*                  Rate   Units                 Total     Units        *
*  ---------------------------------------------------------------     *
* Production       411    Tons Per Hour        1221       Tons         *
* Aggregate        328    Tons Per Hour        1020.3     Tons         *
* Total  A.C.      21.7   Tons Per Hour                                *
* Virgin A.C.      19.2   Tons Per Hour          51.59    Tons         *
*                                                                      *
* R.A.P.  A.C.      2.5   Tons Per Hour                                *
*                                                                      *
* R.A.P.            61    Tons Per Hour         150.3     Tons         *
*                                                                      *
*                                                                      *
* Additive           0    Lbs  Per Hour                                *
*                                       Agg. Composite Moisture   4.6 % *
*                                                                      *
*   Mix     Temperature   290 Deg.      Sling. Position    19 %        *
*   A.C.    Temperature   316 Deg.      Burner Position    84 %        *
*                                       Damper Position    80 %        *
*   Stack   Temperature   283 Deg.                                     *
*                                       B/H Pulse Time     15   Seconds *
*   Instant Actual A.C.    5.25 %       Negative Press    0.17  Inches *
```

Running Mix # 51
Name : 411-E
Description : 411-E/W RAP AC IN RAP 3.5%

Feeder # 1	9.5 Mix %	3.4 Moist %	A.C.	On Time 245 Sec
Feeder # 2	0.0 Mix %	2.5 Moist %	A.C.	Off Time 200 Sec
Feeder # 3	6.6 Mix %	15.7 Moist %		
Feeder # 4	0.0 Mix %	13.7 Moist %		
Feeder # 5	0.0 Mix %	2.7 Moist %		
Feeder # 6	36.0 Mix %	2.6 Moist %	Mix Temp Set	320 Deg
Feeder # 7	28.4 Mix %	4.9 Moist %		
R.A.P.	14.2 Mix %	7.5 Moist %	4.0 A.C. %	
A.C.	5.3 Mix %			
Total	100.0 %		Additive	0.00 Mix %

Condensables

1st

2nd

Condensable

09-04-91 11:10:55 Feeder MAX TPH Calibration Error

09-04-91 11:28:07 Feeder MAX TPH Calibration Error

09-04-91 11:34:29 Bin #1 Low

09-04-91 11:38:40 Feeder MAX TPH Calibration Error

09-04-91 11:48:34 Bin #4 High

09-04-91 11:58:31 Feeder MAX TPH Calibration Error

Lehman – Roberts

09-04-91 12:01:12

Plant Status Report

	Rate	Units	Total	Units
Production	402	Tons Per Hour	1660	Tons
Aggregate	324	Tons Per Hour	1358.7	Tons
Total A.C.	21.1	Tons Per Hour		
Virgin A.C.	18.8	Tons Per Hour	71.38	Tons
R.A.P. A.C.	2.3	Tons Per Hour		
R.A.P.	57	Tons Per Hour	229.9	Tons
Additive	0	Lbs Per Hour		

Agg. Composite Moisture 4.6 %

Mix Temperature	318 Deg.	Sling. Position	19 %
A.C. Temperature	319 Deg.	Burner Position	81 %
		Damper Position	85 %
Stack Temperature	287 Deg.		
		B/H Pulse Time	15 Seconds
Instant Actual A.C.	5.26 %	Negative Press	0.19 Inches
Average Actual A.C.	5.27 %	B/H Diff. Press	4.8 Inches

Running Mix # 51
Name : 411-E
Description : 411-E/W RAP AC IN RAP 3.5%

Feeder # 1	9.5 Mix %	3.4 Moist %	A.C. On Time	245 Sec
Feeder # 2	0.0 Mix %	2.5 Moist %	A.C. Off Time	200 Sec
Feeder # 3	6.6 Mix %	15.7 Moist %		
Feeder # 4	0.0 Mix %	13.7 Moist %		
Feeder # 5	0.0 Mix %	2.7 Moist %		
Feeder # 6	36.0 Mix %	2.6 Moist %	Mix Temp Set	320 Deg
Feeder # 7	28.4 Mix %	4.9 Moist %		
R.A.P.	14.2 Mix %	7.5 Moist %	4.0 A.C. %	
A.C.	5.3 Mix %			
Total	100.0 %		Additive	0.00 Mix %

09-04-91 12:05:53 Feeder MAX TPH Calibration Error

Lehman – Roberts
09-04-91 12:10:13
Plant Status Report

	Rate	Units	Total	Units
Production	403	Tons Per Hour	1723	Tons
Aggregate	329	Tons Per Hour	1407.9	Tons
Total A.C.	21.2	Tons Per Hour		
Virgin A.C.	19.0	Tons Per Hour	74.22	Tons
R.A.P. A.C.	2.2	Tons Per Hour		
R.A.P.	53	Tons Per Hour	241.5	Tons
Additive	0	Lbs Per Hour		

Agg. Composite Moisture 4.6 %

```
*   A.C.      Temperature    320 Deg.       Burner Position     80 %          *
*                                           Damper Position     85 %          *
*   Stack     Temperature    281 Deg.                                         *
*                                           B/H Pulse Time      15   Seconds  *
*   Instant Actual A.C.      5.26 %         Negative  Press     0.19 Inches   *
*   Average Actual A.C.      5.28 %         B/H Diff. Press     4.6  Inches   *
*******************************************************************************
*                                                                             *
*            Running Mix # 51                                                 *
*                   Name : 411-E                                              *
*            Description : 411-E/W RAP AC IN RAP 3.5%                         *
*            ----------------------------------------------------------       *
*  Feeder # 1    9.5 Mix %    3.4 Moist %    A.C.     On  Time   245 Sec     *
*  Feeder # 2    0.0 Mix %    2.5 Moist %    A.C.     Off Time   200 Sec     *
*  Feeder # 3    6.6 Mix %   15.7 Moist %                                     *
*  Feeder # 4    0.0 Mix %   13.7 Moist %                                     *
*  Feeder # 5    0.0 Mix %    2.7 Moist %                                     *
*  Feeder # 6   36.0 Mix %    2.6 Moist %    Mix Temp Set        320 Deg     *
*  Feeder # 7   28.4 Mix %    4.9 Moist %                                     *
*                                                                             *
*  R.A.P.       14.2 Mix %    7.5 Moist %      4.0 A.C. %                     *
*                                                                             *
*  A.C.          5.3 Mix %                                                    *
*                                                                             *
*                                                                             *
*              ------                                                         *
*     Total    100.0 %                      Additive   0.00 Mix %             *
*                                                                             *
*                                                                             *
*******************************************************************************

      09-04-91   12:19:46   Feeder MAX TPH Calibration Error

*******************************************************************************
*                                                                             *
*                              Lehman - Roberts                               *
*         09-04-91                                             12:20:12      *
*                            Plant Status Report                              *
*                                                                             *
*******************************************************************************
*                      Rate   Units                 Total   Units             *
* ---------------------------------------------------------------             *
* Production           394   Tons Per Hour         1792    Tons               *
* Aggregate            317   Tons Per Hour         1461.4  Tons               *
* Total  A.C.         21.0   Tons Per Hour                                    *
* Virgin A.C.         18.7   Tons Per Hour           77.37 Tons               *
*                                                                             *
* R.A.P.  A.C.         2.2   Tons Per Hour                                    *
*                                                                             *
* R.A.P.               56    Tons Per Hour          254.4  Tons               *
*                                                                             *
*                                                                             *
* Additive              0    Lbs  Per Hour                                    *
*                                           Agg. Composite Moisture   4.6 %  *
*                                                                             *
```

```
*                                           Damper Position    88 %           *
*   Stack   Temperature   292 Deg.                                             *
*                                           B/H Pulse Time    15    Seconds   *
*   Instant Actual A.C.   5.31 %            Negative Press    0.17 Inches     *
*   Average Actual A.C.   5.29 %            B/H Diff. Press   4.9  Inches     *
********************************************************************************
*                                                                              *
*          Running Mix # 51                                                    *
*                Name : 411-E                                                  *
*          Description : 411-E/W RAP AC IN RAP 3.5%                            *
*          --------------------------------------------------------------     *
*  Feeder # 1   9.5 Mix %    3.4 Moist %  A.C.    On  Time   245 Sec          *
*  Feeder # 2   0.0 Mix %    2.5 Moist %  A.C.    Off Time   200 Sec          *
*  Feeder # 3   6.6 Mix %   15.7 Moist %                                      *
*  Feeder # 4   0.0 Mix %   13.7 Moist %                                      *
*  Feeder # 5   0.0 Mix %    2.7 Moist %                                      *
*  Feeder # 6  36.0 Mix %    2.6 Moist %  Mix Temp Set       320 Deg          *
*  Feeder # 7  28.4 Mix %    4.9 Moist %                                      *
*                                                                              *
*  R.A.P.      14.2 Mix %    7.5 Moist %    4.0 A.C. %                        *
*                                                                              *
*  A.C.         5.3 Mix %                                                     *
*                                                                              *
*                                                                              *
*            ------                                                            *
*     Total   100.0 %                     Additive   0.00 Mix %               *
*                                                                              *
*                                                                              *
********************************************************************************


********************************************************************************
*                                                                              *
*                                Lehman - Roberts                              *
*        09-04-91                                               12:30:13       *
*                              Plant Status Report                             *
*                                                                              *
********************************************************************************
*                    Rate   Units                  Total     Units            *
* -----------------------------------------------------------------           *
* Production        401    Tons Per Hour          1862      Tons              *
* Aggregate         322    Tons Per Hour          1514.8    Tons              *
* Total   A.C.       21.1  Tons Per Hour                                      *
* Virgin A.C.        18.7  Tons Per Hour           80.51    Tons              *
*                                                                              *
* R.A.P.   A.C.       2.4  Tons Per Hour                                      *
*                                                                              *
* R.A.P.             58    Tons Per Hour          267.5     Tons              *
*                                                                              *
*                                                                              *
* Additive            0    Lbs  Per Hour                                      *
*                                           Agg. Composite Moisture   4.6 %   *
*                                                                              *
*   Mix     Temperature   307 Deg.          Sling. Position    19 %           *
*   A.C.    Temperature   321 Deg.          Burner Position    71 %           *
*                                           Damper Position    89 %           *
*   Stack   Temperature   286 Deg.                                             *
*                                           B/H Pulse Time    15    Seconds   *
*   Instant Actual A.C.   5.26 %            Negative Press    0.19 Inches     *
*   Average Actual A.C.   5.29 %            B/H Diff. Press   5.0  Inches     *
********************************************************************************
```

```
*         Running Mix # 51
*              Name : 411-E
*       Description : 411-E/W RAP AC IN RAP 3.5%
*
*   Feeder # 1    9.5 Mix %     3.4 Moist %    A.C.     On  Time  245 Sec  *
*   Feeder # 2    0.0 Mix %     2.5 Moist %    A.C.     Off Time  200 Sec  *
*   Feeder # 3    6.6 Mix %    15.7 Moist %                                *
*   Feeder # 4    0.0 Mix %    13.7 Moist %                                *
*   Feeder # 5    0.0 Mix %     2.7 Moist %                                *
*   Feeder # 6   36.0 Mix %     2.6 Moist %   Mix Temp Set      320 Deg    *
*   Feeder # 7   28.4 Mix %     4.9 Moist %                                *
*                                                                          *
*   R.A.P.       14.2 Mix %     7.5 Moist %      4.0 A.C. %                *
*                                                                          *
*   A.C.          5.3 Mix %                                                *
*                                                                          *
*                                                                          *
*                ------                                                    *
*      Total    100.0 %                     Additive   0.00 Mix %          *
*                                                                          *
*                                                                          *
****************************************************************************

        09-04-91  12:34:07  Feeder MAX TPH Calibration Error

****************************************************************************
*                                                                          *
*                            Lehman - Roberts                              *
*       09-04-91                                              12:40:12     *
*                          Plant Status Report                             *
*                                                                          *
****************************************************************************
*                      Rate   Units                 Total    Units         *
* -----------------------------------------------------------              *
* Production           398    Tons Per Hour         1932     Tons          *
* Aggregate            323    Tons Per Hour         1568.9   Tons          *
* Total  A.C.          21.2   Tons Per Hour                                *
* Virgin A.C.          19.0   Tons Per Hour           83.64  Tons          *
*                                                                          *
* R.A.P.  A.C.          2.2   Tons Per Hour                                *
*                                                                          *
* R.A.P.               54     Tons Per Hour          280.4   Tons          *
*                                                                          *
*                                                                          *
* Additive              0     Lbs  Per Hour                                *
*                                          Agg. Composite Moisture   4.6 % *
*                                                                          *
*   Mix    Temperature   309 Deg.          Sling. Position    19 %         *
*   A.C.   Temperature   321 Deg.          Burner Position    70 %         *
*                                          Damper Position    80 %         *
*   Stack  Temperature   286 Deg.                                          *
*                                          B/H Pulse Time     15   Seconds *
*   Instant Actual A.C.   5.31 %           Negative  Press    0.17 Inches  *
*   Average Actual A.C.   5.29 %           B/H Diff. Press    4.6  Inches  *
****************************************************************************
*
```

```
*                    Name : 411-E
*             Description : 411-E/W RAP AC IN RAP 3.5%
*           ----------------------------------------------------------------
*  Feeder # 1    9.5 Mix %     3.4 Moist %   A.C.     On  Time  245 Sec    *
*  Feeder # 2    0.0 Mix %     2.5 Moist %   A.C.     Off Time  200 Sec    *
*  Feeder # 3    6.6 Mix %    15.7 Moist %                                 *
*  Feeder # 4    0.0 Mix %    13.7 Moist %                                 *
*  Feeder # 5    0.0 Mix %     2.7 Moist %                                 *
*  Feeder # 6   36.0 Mix %     2.6 Moist %   Mix Temp Set       320 Deg    *
*  Feeder # 7   28.4 Mix %     4.9 Moist %                                 *
*                                                                          *
*  R.A.P.       14.2 Mix %     7.5 Moist %     4.0 A.C. %                  *
*                                                                          *
*  A.C.          5.3 Mix %                                                 *
*                                                                          *
*                                                                          *
*               ------                                                     *
*     Total    100.0 %                       Additive   0.00 Mix %         *
*                                                                          *
*                                                                          *
****************************************************************************


         09-04-91   12:49:49   Bin #5 High


****************************************************************************
*                                                                          *
*                                Lehman - Roberts                          *
*          09-04-91                                          12:50:12      *
*                               Plant Status Report                        *
*                                                                          *
****************************************************************************
*                      Rate   Units                 Total     Units        *
*  ----------------------------------------------------------------        *
•  Production           398   Tons Per Hour          2001     Tons         *
*  Aggregate            321   Tons Per Hour        1622.2     Tons         *
*  Total  A.C.         21.1   Tons Per Hour                                *
*  Virgin A.C.         18.8   Tons Per Hour         86.78     Tons         *
*                                                                          *
*  R.A.P.  A.C.         2.3   Tons Per Hour                                *
*                                                                          *
*  R.A.P.                56   Tons Per Hour         293.3     Tons         *
*                                                                          *
*                                                                          *
*  Additive               0   Lbs   Per Hour                               *
*                                            Agg. Composite Moisture  4.6 % *
*                                                                          *
*   Mix     Temperature   299 Deg.           Sling. Position    19 %       *
*   A.C.    Temperature   321 Deg.           Burner Position    71 %       *
*                                            Damper Position    76 %       *
*   Stack   Temperature   275 Deg.                                         *
*                                            B/H Pulse Time     15  Seconds *
*   Instant Actual A.C.     5.30 %           Negative  Press   0.17 Inches *
*   Average Actual A.C.     5.29 %           B/H Diff. Press   4.5  Inches *
****************************************************************************
*
```

```
          Description : 411-E/W RAP AC IN RAP 3.5%
*  ------------------------------------------------------------------  *
*  Feeder # 1    9.5 Mix %    3.4 Moist %   A.C.    On  Time  245 Sec  *
*  Feeder # 2    0.0 Mix %    2.5 Moist %   A.C.    Off Time  200 Sec  *
*  Feeder # 3    6.6 Mix %   15.7 Moist %                              *
*  Feeder # 4    0.0 Mix %   13.7 Moist %                              *
*  Feeder # 5    0.0 Mix %    2.7 Moist %                              *
*  Feeder # 6   36.0 Mix %    2.6 Moist %   Mix Temp Set     320 Deg   *
*  Feeder # 7   28.4 Mix %    4.9 Moist %                              *
*                                                                      *
*  R.A.P.       14.2 Mix %    7.5 Moist %      4.0 A.C. %              *
*                                                                      *
*  A.C.          5.3 Mix %                                             *
*                                                                      *
*                                                                      *
*              ------                                                  *
*     Total    100.0 %                   Additive   0.00 Mix %         *
*                                                                      *
*                                                                      *
************************************************************************


************************************************************************
*                                                                      *
*                              Lehman - Roberts                        *
*         09-04-91                                        12:50:30     *
*                            Plant Status Report                       *
*                                                                      *
************************************************************************
*                   Rate   Units                Total     Units        *
* ---------------------------------------------------------------      *
* Production        417    Tons Per Hour        2003      Tons         *
* Aggregate         341    Tons Per Hour        1623.6    Tons         *
* Total  A.C.        21.2  Tons Per Hour                               *
* Virgin A.C.        19.1  Tons Per Hour          86.87   Tons         *
*                                                                      *
* R.A.P.  A.C.        2.3  Tons Per Hour                               *
*                                                                      *
* R.A.P.             55    Tons Per Hour         293.7    Tons         *
*                                                                      *
*                                                                      *
* Additive            0    Lbs  Per Hour                               *
*                                     Agg. Composite Moisture   4.6 %  *
*                                                                      *
*   Mix     Temperature   301 Deg.    Sling. Position    19 %          *
*   A.C.    Temperature   321 Deg.    Burner Position    71 %          *
*                                     Damper Position    76 %          *
*   Stack   Temperature   274 Deg.                                     *
*                                     B/H Pulse Time     15   Seconds  *
*   Instant Actual A.C.    5.09 %     Negative Press    0.17  Inches   *
*   Average Actual A.C.    5.23 %     B/H Diff. Press    4.4  Inches   *
************************************************************************
*                                                                      *
*         Running Mix # 51                                             *
*                   Name : 411-E                                       *
*         Description : 411-E/W RAP AC IN RAP 3.5%                     *
*         -----------------------------------------------------------  *
*  Feeder # 1    9.5 Mix %    3.4 Moist %   A.C.    On  Time  245 Sec  *
*  Feeder # 2    0.0 Mix %    2.5 Moist %   A.C.    Off Time  200 Sec  *
*  Feeder # 3    6.6 Mix %   15.7 Moist %                              *
*  Feeder # 4    0.0 Mix %   13.7 Moist %                              *
```

```
*  Feeder # 6   36.0 Mix %    2.6 Moist %   Mix Temp Set        320 Deg  *
*  Feeder # 7   28.4 Mix %    4.9 Moist %                                *
*                                                                        *
*  R.A.P.       14.2 Mix %    7.5 Moist %    4.0 A.C. %                  *
*                                                                        *
*  A.C.          5.3 Mix %                                               *
*                                                                        *
*                                                                        *
*              ------                                                    *
*     Total    100.0 %                 Additive   0.00 Mix %             *
*                                                                        *
*                                                                        *
**************************************************************************
```

09-04-91 12:59:32 Feeder MAX TPH Calibration Error

09-04-91 13:09:03 Feeder MAX TPH Calibration Error

Condensalks

3rd

09-04-91 13:17:16 Bin #4 High

09-04-91 13:25:35 Bin #5 High

09-04-91 13:26:19 Bin Top Conveyor Right Overtravel

```
*****************************************************************
*                                                               *
*                      Lehman - Roberts                         *
*      09-04-91                                     13:35:09    *
*                     Plant Status Report                       *
*                                                               *
*****************************************************************
*                Rate   Units              Total    Units       *
*  -------------------------------------------------------      *
* Production     401    Tons Per Hour      2315     Tons        *
* Aggregate      323    Tons Per Hour      1864.1   Tons        *
* Total   A.C.    21.0  Tons Per Hour                           *
* Virgin A.C.     18.7  Tons Per Hour      100.90   Tons        *
*                                                               *
* R.A.P.   A.C.    2.4  Tons Per Hour                           *
*                                                               *
* R.A.P.          57    Tons Per Hour      351.3    Tons        *
*                                                               *
*                                                               *
* Additive         0    Lbs  Per Hour                           *
*                              Agg. Composite Moisture   4.6 %  *
*                                                               *
*   Mix    Temperature   315 Deg.   Sling. Position    19 %     *
*   A.C.   Temperature   322 Deg.   Burner Position    84 %     *
*                                   Damper Position    88 %     *
*   Stack  Temperature   291 Deg.                               *
*                                   B/H Pulse Time     10  Seconds *
*   Instant Actual A.C.   5.22 %    Negative Press   0.19 Inches *
*   Average Actual A.C.   5.31 %    B/H Diff. Press   4.4 Inches *
*****************************************************************
*                                                               *
*        Running Mix # 51                                       *
*               Name : 411-E                                    *
*        Description : 411-E/W RAP AC/IN RAP 3.5%               *
*                                                               *
*  Feeder # 1   9.5 Mix %   3.4 Moist %   A.C.   On Time  245 Sec *
*  Feeder # 2   0.0 Mix %   2.5 Moist %   A.C.   Off Time 200 Sec *
*  Feeder # 3   6.6 Mix %  15.7 Moist %                         *
*  Feeder # 4   0.0 Mix %  13.7 Moist %                         *
```

```
*  Feeder # 7   28.4 Mix %     4.9 Moist %
*
*  R.A.P.        14.2 Mix %     7.5 Moist %     4.0 A.C. %
*
*  A.C.           5.3 Mix %
*
*
*                ------
*     Total     100.0 %                  Additive   0.00 Mix %                    *
*                                                                                 *
*                                                                                 *
***********************************************************************************
```

09-04-91 13:35:13 Feeder MAX TPH Calibration Error

09-04-91 13:47:15 Bin #3 High

09-04-91 13:47:43 Bin Top Conveyor Right Overtravel

09-04-91 13:54:06 Feeder MAX TPH Calibration Error

```
***********************************************************************************
*                                                                                 *
*                          Lehman - Roberts                                       *
*      09-04-91                                                   13:54:13        *
*                         Plant Status Report                                     *
*                                                                                 *
***********************************************************************************
*                 Rate   Units                   Total    Units                   *
*  ------------------------------------------------------------                   *
*  Production      399   Tons Per Hour           2449     Tons                    *
*  Aggregate       321   Tons Per Hour         1966.8     Tons                    *
*  Total  A.C.    21.3   Tons Per Hour                                            *
*  Virgin A.C.    19.0   Tons Per Hour         106.90     Tons                    *
*                                                                                 *
*  R.A.P.  A.C.    2.3   Tons Per Hour                                            *
*                                                                                 *
*  R.A.P.           57   Tons Per Hour          376.0     Tons                    *
*                                                                                 *
*                                                                                 *
*  Additive          0   Lbs  Per Hour                                            *
*                                    Agg. Composite Moisture    4.6 %             *
*
```

A.C. Temperature 323 Deg. Burner Position 83 %

Damper Position 90 %

Stack Temperature 291 Deg.

B/H Pulse Time 10 Seconds

Instant Actual A.C. 5.33 % Negative Press 0.20 Inches

Average Actual A.C. 5.29 % B/H Diff. Press 4.4 Inches

Running Mix # 51

Name : 411-E

Description : 411-E/W RAP AC IN RAP 3.5%

Feeder # 1	9.5 Mix %	3.4 Moist %	A.C. On Time	245 Sec
Feeder # 2	0.0 Mix %	2.5 Moist %	A.C. Off Time	200 Sec
Feeder # 3	6.6 Mix %	15.7 Moist %		
Feeder # 4	0.0 Mix %	13.7 Moist %		
Feeder # 5	0.0 Mix %	2.7 Moist %		
Feeder # 6	36.0 Mix %	2.6 Moist %	Mix Temp Set	320 Deg
Feeder # 7	28.4 Mix %	4.9 Moist %		
R.A.P.	14.2 Mix %	7.5 Moist %	4.0 A.C. %	
A.C.	5.3 Mix %			
Total	100.0 %		Additive	0.00 Mix %

Lehman - Roberts

09-04-91 14:04:14

Plant Status Report

	Rate	Units	Total	Units
Production	399	Tons Per Hour	2518	Tons
Aggregate	325	Tons Per Hour	2020.4	Tons
Total A.C.	21.2	Tons Per Hour		
Virgin A.C.	19.0	Tons Per Hour	110.06	Tons
R.A.P. A.C.	2.2	Tons Per Hour		
R.A.P.	53	Tons Per Hour	388.7	Tons
Additive	0	Lbs Per Hour		

Agg. Composite Moisture 4.6 %

Mix Temperature 314 Deg. Sling. Position 19 %

A.C. Temperature 323 Deg. Burner Position 78 %

Damper Position 90 %

Stack Temperature 290 Deg.

B/H Pulse Time 10 Seconds

Instant Actual A.C. 5.31 % Negative Press 0.20 Inches

Average Actual A.C. 5.29 % B/H Diff. Press 4.4 Inches

```
*
*              Running Mix # 51
*                   Name : 411-E
*              Description : 411-E/W RAP AC IN RAP 3.5%
*              ------------------------------------------------------------------------
*   Feeder # 1     9.5 Mix %      3.4 Moist %   A.C.    On  Time   245 Sec  *
*   Feeder # 2     0.0 Mix %      2.5 Moist %   A.C.    Off Time   200 Sec  *
*   Feeder # 3     6.6 Mix %     15.7 Moist %                               *
*   Feeder # 4     0.0 Mix %     13.7 Moist %                               *
*   Feeder # 5     0.0 Mix %      2.7 Moist %                               *
*   Feeder # 6    36.0 Mix %      2.6 Moist %   Mix Temp Set       320 Deg  *
*   Feeder # 7    28.4 Mix %      4.9 Moist %                               *
*                                                                           *
*   R.A.P.        14.2 Mix %      7.5 Moist %      4.0 A.C. %               *
*                                                                           *
*   A.C.           5.3 Mix %                                                *
*                                                                           *
*                                                                           *
*                -------                                                    *
*       Total    100.0 %                        Additive   0.00 Mix %       *
*                                                                           *
*                                                                           *
*****************************************************************************



*****************************************************************************
*                                                                           *
*                              Lehman - Roberts                             *
*          09-04-91                                          14:14:13       *
*                             Plant Status Report                           *
*                                                                           *
*****************************************************************************
*                  Rate   Units                     Total     Units         *
*   ---------------------------------------------------------------------   *
*  Production      401    Tons Per Hour             2589      Tons          *
*  Aggregate       324    Tons Per Hour             2074.2    Tons          *
*  Total   A.C.     21.3  Tons Per Hour                                     *
*  Virgin A.C.      19.0  Tons Per Hour             113.21    Tons          *
*                                                                           *
*  R.A.P.  A.C.      2.2  Tons Per Hour                                     *
*                                                                           *
*  R.A.P.           56    Tons Per Hour             401.7     Tons          *
*                                                                           *
*                                                                           *
*  Additive          0    Lbs  Per Hour                                     *
*                                         Agg. Composite Moisture   4.6 %  *
*                                                                           *
*    Mix       Temperature    321 Deg.    Sling. Position    19 %           *
*    A.C.      Temperature    323 Deg.    Burner Position    73 %           *
*                                         Damper Position    90 %           *
*    Stack     Temperature    294 Deg.                                      *
*                                         B/H Pulse Time     10   Seconds  *
*    Instant Actual A.C.      5.30 %      Negative  Press    0.19 Inches   *
*    Average Actual A.C.      5.29 %      B/H Diff. Press    4.5  Inches   *
*****************************************************************************
*                                                                           *
*              Running Mix # 51                                             *
*                   Name : 411-E                                            *
*              Description : 411-E/W RAP AC IN RAP 3.5%                     *
*              ------------------------------------------------------------ *
*   Feeder # 1     9.5 Mix %      3.4 Moist %   A.C.    On  Time   245 Sec  *
```

```
*  Feeder # 4   0.0 Mix %   13.7 Moist %                                        *
*  Feeder # 5   0.0 Mix %    2.7 Moist %                                        *
*  Feeder # 6  36.0 Mix %    2.6 Moist %   Mix Temp Set        320 Deg          *
*  Feeder # 7  28.4 Mix %    4.9 Moist %                                        *
*                                                                               *
*  R.A.P.      14.2 Mix %    7.5 Moist %      4.0 A.C. %                        *
*                                                                               *
*  A.C.         5.3 Mix %                                                       *
*                                                                               *
*                                                                               *
*              ------                                                           *
*     Total   100.0 %                        Additive   0.00 Mix %              *
*                                                                               *
*                                                                               *
*********************************************************************************


          09-04-91  14:16:23  Feeder MAX TPH Calibration Error


          09-04-91  14:23:13  Bin #5 High


*********************************************************************************
*                                                                               *
*                            Lehman - Roberts                                   *
*        09-04-91                                              14:24:14         *
*                          Plant Status Report                                  *
*                                                                               *
*********************************************************************************
*                 Rate   Units                   Total    Units                 *
* ----------------------------------------------------------                    *
* Production       402   Tons Per Hour           2659     Tons                  *
* Aggregate        326   Tons Per Hour           2128.6   Tons                  *
* Total  A.C.     21.1   Tons Per Hour                                          *
* Virgin A.C.     18.9   Tons Per Hour           116.38   Tons                  *
*                                                                               *
* R.A.P.  A.C.     2.3   Tons Per Hour                                          *
*                                                                               *
* R.A.P.            55   Tons Per Hour           414.6    Tons                  *
*                                                                               *
*                                                                               *
* Additive           0   Lbs  Per Hour                                          *
*                                           Agg. Composite Moisture   4.6 %     *
*                                                                               *
*   Mix    Temperature   319 Deg.           Sling. Position     19 %            *
*   A.C.   Temperature   324 Deg.           Burner Position     66 %            *
*                                           Damper Position     85 %            *
*   Stack  Temperature   292 Deg.                                               *
*                                           B/H Pulse Time      10   Seconds    *
*   Instant Actual A.C.   5.23 %            Negative Press      0.17 Inches     *
*   Average Actual A.C.   5.29 %            B/H Diff. Press     4.3  Inches     *
*********************************************************************************
*                                                                               *
```

```
*          Description : 411-E/W RAP AC IN RAP 3.5%                         *
*   ---------------------------------------------------------------------   *
*   Feeder # 1    9.5 Mix %     3.4 Moist %   A.C.    On  Time  245 Sec     *
*   Feeder # 2    0.0 Mix %     2.5 Moist %   A.C.    Off Time  200 Sec     *
*   Feeder # 3    6.6 Mix %    15.7 Moist %                                 *
*   Feeder # 4    0.0 Mix %    13.7 Moist %                                 *
*   Feeder # 5    0.0 Mix %     2.7 Moist %                                 *
*   Feeder # 6   36.0 Mix %     2.6 Moist %   Mix Temp Set       320 Deg    *
*   Feeder # 7   28.4 Mix %     4.9 Moist %                                 *
*                                                                           *
*   R.A.P.       14.2 Mix %     7.5 Moist %    4.0 A.C. %                   *
*                                                                           *
*   A.C.          5.3 Mix %                                                 *
*                                                                           *
*                                                                           *
*               ------                                                      *
*      Total    100.0 %                      Additive    0.00 Mix %         *
*                                                                           *
*                                                                           *
*****************************************************************************

          09-04-91   14:28:37   Feeder MAX TPH Calibration Error

*****************************************************************************
*                                                                           *
*                              Lehman - Roberts                             *
*          09-04-91                                           14:34:14      *
*                            Plant Status Report                            *
*                                                                           *
*****************************************************************************
*                    Rate   Units                   Total    Units          *
* ----------------------------------------------------------------          *
* Production          401   Tons Per Hour           2728      Tons          *
* Aggregate           326   Tons Per Hour           2182.2    Tons          *
* Total   A.C.       21.2   Tons Per Hour                                   *
* Virgin A.C.        19.0   Tons Per Hour           119.53    Tons          *
*                                                                           *
* R.A.P.  A.C.        2.2   Tons Per Hour                                   *
*                                                                           *
* R.A.P.             54     Tons Per Hour           427.4     Tons          *
*                                                                           *
*                                                                           *
* Additive            0     Lbs   Per Hour                                  *
*                                            Agg. Composite Moisture  4.6 % *
*                                                                           *
*  Mix    Temperature    308 Deg.            Sling. Position    19 %        *
*  A.C.   Temperature    323 Deg.            Burner Position    70 %        *
*                                            Damper Position    80 %        *
*  Stack  Temperature    288 Deg.                                           *
*                                            B/H Pulse Time     10   Seconds *
*  Instant Actual A.C.    5.28 %             Negative  Press   0.19 Inches  *
*  Average Actual A.C.    5.29 %             B/H Diff. Press    4.3 Inches  *
*****************************************************************************
*                                                                           *
*          Running Mix # 51                                                 *
```

```
*    ------------------------------------------------------------------------    *
*   Feeder # 1   9.5 Mix %    3.4 Moist %   A.C.    On  Time  245 Sec  *
*   Feeder # 2   0.0 Mix %    2.5 Moist %   A.C.    Off Time  200 Sec  *
*   Feeder # 3   6.6 Mix %   15.7 Moist %                               *
*   Feeder # 4   0.0 Mix %   13.7 Moist %                               *
*   Feeder # 5   0.0 Mix %    2.7 Moist %                               *
*   Feeder # 6  36.0 Mix %    2.6 Moist %   Mix Temp Set      320 Deg   *
*   Feeder # 7  28.4 Mix %    4.9 Moist %                               *
*                                                                       *
*   R.A.P.      14.2 Mix %    7.5 Moist %     4.0 A.C. %                *
*                                                                       *
*   A.C.         5.3 Mix %                                              *
*                                                                       *
*                                                                       *
*              ------                                                   *
*      Total   100.0 %                   Additive   0.00 Mix %          *
*                                                                       *
*                                                                       *
*************************************************************************




*************************************************************************
*                                                                       *
*                               Lehman - Roberts                        *
*          09-04-91                                        14:38:05     *
*                             Plant Status Report                       *
*                                                                       *
*************************************************************************
*                   Rate   Units                Total    Units          *
* --------------------------------------------------------              *
* Production         400   Tons Per Hour        2755     Tons           *
* Aggregate          325   Tons Per Hour        2203.1   Tons           *
* Total  A.C.       21.1   Tons Per Hour                                *
* Virgin A.C.       18.9   Tons Per Hour        120.75   Tons           *
*                                                                       *
* R.A.P.  A.C.       2.2   Tons Per Hour                                *
*                                                                       *
* R.A.P.             54    Tons Per Hour        432.2    Tons           *
*                                                                       *
*                                                                       *
* Additive           0     Lbs  Per Hour                                *
*                                      Agg. Composite Moisture   4.6 %  *
*                                                                       *
*   Mix    Temperature    313 Deg.     Sling. Position    19 %          *
*   A.C.   Temperature    324 Deg.     Burner Position    69 %          *
*                                      Damper Position    80 %          *
*   Stack  Temperature    285 Deg.                                      *
*                                      B/H Pulse Time     10   Seconds  *
*   Instant Actual A.C.   5.27 %       Negative  Press    0.18 Inches   *
*   Average Actual A.C.   5.30 %       B/H Diff. Press    4.2  Inches   *
*************************************************************************
*                                                                       *
*          Running Mix # 51                                             *
*                 Name : 411-E                                          *
*          Description : 411-E/W RAP AC IN RAP 3.5%                     *
*    ------------------------------------------------------------------------    *
*   Feeder # 1   9.5 Mix %    3.4 Moist %   A.C.    On  Time  245 Sec  *
*   Feeder # 2   0.0 Mix %    2.5 Moist %   A.C.    Off Time  200 Sec  *
*   Feeder # 3   6.6 Mix %   15.7 Moist %                               *
*   Feeder # 4   0.0 Mix %   13.7 Moist %                               *
```

* Feeder # 6 36.0 Mix % 2.6 Moist % Mix Temp Set 320 Deg *
* Feeder # 7 28.4 Mix % 4.9 Moist % *
*
* R.A.P. 14.2 Mix % 7.5 Moist % 4.0 A.C. % *
*
* A.C. 5.3 Mix % *
*
*
* ------ *
* Total 100.0 % Additive 0.00 Mix % *
*
*
****

09-04-91 14:38:26 Feeder MAX TPH Calibration Error

09-04-91 14:38:34 Main Flame Failure

09-04-91 14:38:36 Asphalt Valve Recirculate

09-04-91 14:38:38 System Stop

GASEOUS & PAH'S
Run 1

09-03-91 09:39:46 Asphalt Deviation

09-03-91 09:46:54 Feeder MAX TPH Calibration Error

```
***********************************************************************
*                                                                     *
*                         Lehman - Roberts                            *
*        09-03-91                                        11:26:11     *
*                       Plant Status Report                           *
*                                                                     *
***********************************************************************
*                  Rate   Units              Total     Units          *
* ---------------------------------------------------------           *
* Production       348    Tons Per Hour      1158      Tons           *
* Aggregate        283    Tons Per Hour       895.6    Tons           *
* Total  A.C.      18.4   Tons Per Hour                               *
* Virgin A.C.      16.5   Tons Per Hour        52.47   Tons           *
*                                                                     *
* R.A.P.  A.C.      1.9   Tons Per Hour                               *
*                                                                     *
* R.A.P.           47     Tons Per Hour       210.5    Tons           *
*                                                                     *
*                                                                     *
* Additive          0     Lbs  Per Hour                               *
*                                   Agg. Composite Moisture    4.6 %  *
*                                                                     *
*   Mix    Temperature   307 Deg.   Sling. Position     3 %           *
*   A.C.   Temperature   299 Deg.   Burner Position    45 %           *
*                                   Damper Position    61 %           *
*   Stack  Temperature   246 Deg.                                     *
*                                   B/H Pulse Time     25    Seconds  *
*   Instant Actual A.C.  5.27 %     Negative  Press    0.10  Inches   *
*   Average Actual A.C.  5.31 %     B/H Diff. Press    3.3   Inches   *
***********************************************************************
*                                                                     *
*          Running Mix # 51                                           *
*                 Name : 411-E                                        *
*          Description : 411-E/W RAP AC IN RAP 3.5%                   *
*          ----------------------------------------------------       *
*  Feeder # 1   9.5 Mix %   3.4 Moist %   A.C.  On  Time  245 Sec     *
*  Feeder # 2   0.0 Mix %   2.5 Moist %   A.C.  Off Time  200 Sec     *
*  Feeder # 3   6.6 Mix %  15.7 Moist %                               *
*  Feeder # 4   0.0 Mix %  13.7 Moist %                               *
*  Feeder # 5   0.0 Mix %   2.7 Moist %                               *
*  Feeder # 6  36.0 Mix %   2.6 Moist %   Mix Temp Set      320 Deg   *
*  Feeder # 7  28.4 Mix %   4.9 Moist %                               *
*                                                                     *
*  R.A.P.      14.2 Mix %   6.2 Moist %    4.0 A.C. %                 *
*                                                                     *
```

Total 100.0 % Additive 0.00 Mix %

Lehman - Roberts

09-03-91 11:35:51

Plant Status Report

	Rate	Units	Total	Units
Production	346	Tons Per Hour	1217	Tons
Aggregate	281	Tons Per Hour	941.0	Tons
Total A.C.	18.1	Tons Per Hour		
Virgin A.C.	16.2	Tons Per Hour	55.13	Tons
R.A.P. A.C.	1.9	Tons Per Hour		
R.A.P.	47	Tons Per Hour	220.9	Tons
Additive	0	Lbs Per Hour		

Agg. Composite Moisture 4.6 %

Mix Temperature	308 Deg.	Sling. Position	8 %
A.C. Temperature	300 Deg.	Burner Position	46 %
		Damper Position	61 %
Stack Temperature	246 Deg.		
		B/H Pulse Time	30 Seconds
Instant Actual A.C.	5.23 %	Negative Press	0.08 Inches
Average Actual A.C.	5.29 %	B/H Diff. Press	3.3 Inches

Running Mix # 51

Name : 411-E

Description : 411-E/W RAP AC IN RAP 3.5%

Feeder # 1	9.5 Mix %	3.4 Moist %	A.C. On Time 245 Sec
Feeder # 2	0.0 Mix %	2.5 Moist %	A.C. Off Time 200 Sec
Feeder # 3	6.6 Mix %	15.7 Moist %	
Feeder # 4	0.0 Mix %	13.7 Moist %	
Feeder # 5	0.0 Mix %	2.7 Moist %	
Feeder # 6	36.0 Mix %	2.6 Moist %	Mix Temp Set 320 Deg
Feeder # 7	28.4 Mix %	4.9 Moist %	
R.A.P.	14.2 Mix %	6.2 Moist %	4.0 A.C. %
A.C.	5.3 Mix %		

Total 100.0 % Additive 0.00 Mix %

```
******************************************************************************
*                                                                            *
*                          Lehman - Roberts                                  *
*          09-03-91                                         11:45:53         *
*                        Plant Status Report                                 *
*                                                                            *
******************************************************************************
*               Rate    Units                Total    Units                  *
*  ---------------------------------------------------------                 *
* Production    352   Tons Per Hour         1277     Tons                      *
* Aggregate     285   Tons Per Hour          987.8   Tons                      *
* Total  A.C.    18.7 Tons Per Hour                                          *
* Virgin A.C.    16.7 Tons Per Hour            57.88 Tons                    *
*                                                                            *
* R.A.P.  A.C.    2.0 Tons Per Hour                                          *
*                                                                            *
* R.A.P.         48   Tons Per Hour          232.2   Tons                    *
*                                                                            *
*                                                                            *
* Additive        0   Lbs  Per Hour                                          *
*                                     Agg. Composite Moisture       4.6 %    *
*                                                                            *
*   Mix     Temperature   305 Deg.    Sling. Position     11 %               *
*   A.C.    Temperature   300 Deg.    Burner Position     50 %               *
*                                     Damper Position     61 %               *
*   Stack   Temperature   247 Deg.                                           *
*                                     B/H Pulse Time      30     Seconds     *
*   Instant Actual A.C.   5.31 %      Negative  Press      0.10  Inches      *
*   Average Actual A.C.   5.28 %      B/H Diff. Press      3.6   Inches      *
******************************************************************************
*                                                                            *
*          Running Mix # 51                                                  *
*                Name : 411-E                                                *
*          Description : 411-E/W RAP AC IN RAP 3.5%                          *
*          ------------------------------------------------------            *
*  Feeder # 1    9.5 Mix %     3.4 Moist %    A.C.    On   Time  245 Sec     *
*  Feeder # 2    0.0 Mix %     2.5 Moist %    A.C.    Off  Time  200 Sec     *
*  Feeder # 3    6.6 Mix %    15.7 Moist %                                   *
*  Feeder # 4    0.0 Mix %    13.7 Moist %                                   *
*  Feeder # 5    0.0 Mix %     2.7 Moist %                                   *
*  Feeder # 6   36.0 Mix %     2.6 Moist %    Mix Temp Set        320 Deg    *
*  Feeder # 7   28.4 Mix %     4.9 Moist %                                   *
*                                                                            *
*  R.A.P.       14.2 Mix %     6.2 Moist %      4.0 A.C. %                   *
*                                                                            *
*  A.C.          5.3 Mix %                                                   *
*                                                                            *
*                                                                            *
*              ------                                                        *
*    Total     100.0 %                        Additive   0.00 Mix %          *
*                                                                            *
*                                                                            *
******************************************************************************
```

```
*
*                                  Lehman — Roberts                                *
*        09-03-91                                                   11:55:52      *
*                                 Plant Status Report                              *
*                                                                                  *
************************************************************************************
*                    Rate   Units                     Total    Units              *
*  ------------------------------------------------------------------             *
* Production        354   Tons Per Hour         1337     Tons                     *
* Aggregate         284   Tons Per Hour         1034.4   Tons                     *
* Total  A.C.        18.7 Tons Per Hour                                            *
* Virgin A.C.        16.6 Tons Per Hour           60.61  Tons                     *
*                                                                                  *
* R.A.P.  A.C.        2.1 Tons Per Hour                                            *
*                                                                                  *
* R.A.P.             51   Tons Per Hour          243.6   Tons                     *
*                                                                                  *
*                                                                                  *
* Additive            0   Lbs  Per Hour                                            *
*                                            Agg. Composite Moisture    4.6 %     *
*                                                                                  *
*   Mix   Temperature     291 Deg.     Sling. Position     30 %                   *
*   A.C.  Temperature     300 Deg.     Burner Position     59 %                   *
*                                      Damper Position     64 %                   *
*   Stack Temperature     247 Deg.                                                 *
*                                      B/H Pulse Time      30      Seconds        *
*   Instant Actual A.C.   5.26 %       Negative  Press      0.07 Inches           *
*   Average Actual A.C.   5.29 %       B/H Diff.  Press     4.1   Inches          *
************************************************************************************
*                                                                                  *
*          Running Mix # 51                                                        *
*                 Name : 411-E                                                     *
*          Description : 411-E/W RAP AC IN RAP 3.5%                                *
*          ------------------------------------------------------                 *
*  Feeder # 1    9.5 Mix %      3.4 Moist %   A.C.     On  Time  245 Sec          *
*  Feeder # 2    0.0 Mix %      2.5 Moist %   A.C.     Off Time  200 Sec          *
*  Feeder # 3    6.6 Mix %     15.7 Moist %                                       *
*  Feeder # 4    0.0 Mix %     13.7 Moist %                                       *
*  Feeder # 5    0.0 Mix %      2.7 Moist %                                       *
*  Feeder # 6   36.0 Mix %      2.6 Moist %   Mix Temp Set        320 Deg         *
*  Feeder # 7   28.4 Mix %      4.9 Moist %                                       *
*                                                                                  *
*  R.A.P.       14.2 Mix %      6.2 Moist %     4.0 A.C. %                        *
*                                                                                  *
*  A.C.          5.3 Mix %                                                         *
*                                                                                  *
*                                                                                  *
*             ------                                                               *
*     Total   100.0 %                  Additive   0.00 Mix %                      *
*                                                                                  *
*                                                                                  *
************************************************************************************



************************************************************************************
*                                                                                  *
*                                  Lehman - Roberts                                *
*        09-03-91                                                   12:05:52      *
*                                 Plant Status Report                              *
*                                                                                  *
************************************************************************************
```

* Production 355 Tons Per Hour 1400 Tons *
* Aggregate 285 Tons Per Hour 1082.0 Tons *
* Total A.C. 18.5 Tons Per Hour *
* Virgin A.C. 16.4 Tons Per Hour 63.37 Tons *
* *
* R.A.P. A.C. 2.1 Tons Per Hour *
* *
* R.A.P. 51 Tons Per Hour 254.9 Tons *
* *
* *
* Additive 0 Lbs Per Hour *
* Agg. Composite Moisture 4.6 % *
* *
* Mix Temperature 325 Deg. Sling. Position 42 % *
* A.C. Temperature 300 Deg. Burner Position 51 % *
* Damper Position 61 % *
* Stack Temperature 268 Deg. *
* B/H Pulse Time 30 Seconds *
* Instant Actual A.C. 5.23 % Negative Press 0.08 Inches *
* Average Actual A.C. 5.28 % B/H Diff. Press 4.4 Inches *
****
* *
* Running Mix # 51 *
* Name : 411-E *
* Description : 411-E/W RAP AC IN RAP 3.5% *
* -- *
* Feeder # 1 9.5 Mix % 3.4 Moist % A.C. On Time 245 Sec *
* Feeder # 2 0.0 Mix % 2.5 Moist % A.C. Off Time 200 Sec *
* Feeder # 3 6.6 Mix % 15.7 Moist % *
* Feeder # 4 0.0 Mix % 13.7 Moist % *
* Feeder # 5 0.0 Mix % 2.7 Moist % *
* Feeder # 6 36.0 Mix % 2.6 Moist % Mix Temp Set 320 Deg *
* Feeder # 7 28.4 Mix % 4.9 Moist % *
* *
* R.A.P. 14.2 Mix % 6.2 Moist % 4.0 A.C. % *
* *
* A.C. 5.3 Mix % *
* *
* *
* ------ *
* Total 100.0 % Additive 0.00 Mix % *
* *
* *
****

****
* *
* Lehman - Roberts *
* 09-03-91 12:15:54 *
* Plant Status Report *
* *
****
* Rate Units Total Units *
* -- *
* Production 353 Tons Per Hour 1461 Tons *
* Aggregate 285 Tons Per Hour 1129.0 Tons *
* Total A.C. 18.7 Tons Per Hour *
* Virgin A.C. 16.6 Tons Per Hour 66.13 Tons *
* *

```
* R.A.P.              49   Tons Per Hour         266.3  Tons                  *
*                                                                             *
*                                                                             *
* Additive             0   Lbs  Per Hour                                      *
*                                      Agg. Composite Moisture   4.6 %        *
*                                                                             *
*   Mix      Temperature   306 Deg.    Sling. Position     42 %               *
*   A.C.     Temperature   300 Deg.    Burner Position     53 %               *
*                                      Damper Position     61 %               *
*   Stack    Temperature   258 Deg.                                           *
*                                      B/H Pulse Time      30    Seconds      *
*   Instant Actual A.C.    5.25 %      Negative  Press     0.08 Inches        *
*   Average Actual A.C.    5.29 %      B/H Diff. Press     3.7   Inches       *
*******************************************************************************
*                                                                             *
*          Running Mix # 51                                                   *
*                 Name  : 411-E                                               *
*          Description : 411-E/W RAP AC IN RAP 3.5%                           *
*          ------------------------------------------------------------       *
*  Feeder # 1    9.5 Mix %    3.4 Moist %    A.C.     On  Time  245 Sec       *
*  Feeder # 2    0.0 Mix %    2.5 Moist %    A.C.     Off Time  200 Sec       *
*  Feeder # 3    6.6 Mix %   15.7 Moist %                                     *
*  Feeder # 4    0.0 Mix %   13.7 Moist %                                     *
*  Feeder # 5    0.0 Mix %    2.7 Moist %                                     *
*  Feeder # 6   36.0 Mix %    2.6 Moist %    Mix Temp Set        320 Deg      *
*  Feeder # 7   28.4 Mix %    4.9 Moist %                                     *
*                                                                             *
*  R.A.P.       14.2 Mix %    6.2 Moist %      4.0 A.C. %                     *
*                                                                             *
*  A.C.          5.3 Mix %                                                    *
*                                                                             *
*                                                                             *
*             ------                                                          *
*     Total   100.0 %                      Additive   0.00 Mix %              *
*                                                                             *
*                                                                             *
*******************************************************************************



*******************************************************************************
*                                                                             *
*                               Lehman - Roberts                              *
*         09-03-91                                          12:25:54          *
*                             Plant Status Report                             *
*                                                                             *
*******************************************************************************
*               Rate   Units                   Total   Units                  *
* -----------------------------------------------------------                 *
* Production     345   Tons Per Hour         1522      Tons                   *
* Aggregate      279   Tons Per Hour         1175.6    Tons                   *
* Total  A.C.   18.2   Tons Per Hour                                          *
* Virgin A.C.   16.3   Tons Per Hour           68.87   Tons                   *
*                                                                             *
* R.A.P.  A.C.   1.9   Tons Per Hour                                          *
*                                                                             *
* R.A.P.          48   Tons Per Hour          277.6    Tons                   *
*                                                                             *
*                                                                             *
* Additive         0   Lbs  Per Hour                                          *
*                                      Agg. Composite Moisture   4.6 %        *
```

```
*   A.C.    Temperature   300 Deg.     Burner Position   53 %             *
*                                      Damper Position   61 %             *
*   Stack   Temperature   259 Deg.                                        *
*                                      B/H Pulse Time    30    Seconds    *
*   Instant Actual A.C.    5.27 %      Negative Press     0.08 Inches     *
*   Average Actual A.C.    5.29 %      B/H Diff. Press    3.7  Inches     *
**************************************************************************
*                                                                         *
*        Running Mix # 51                                                 *
*              Name : 411-E                                               *
*        Description : 411-E/W RAP AC IN RAP 3.5%                         *
*        -------------------------------------------------------------    *
*  Feeder # 1    9.5 Mix %     3.4 Moist %   A.C.    On  Time  245 Sec    *
*  Feeder # 2    0.0 Mix %     2.5 Moist %   A.C.    Off Time  200 Sec    *
*  Feeder # 3    6.6 Mix %    15.7 Moist %                                *
*  Feeder # 4    0.0 Mix %    13.7 Moist %                                *
*  Feeder # 5    0.0 Mix %     2.7 Moist %                                *
*  Feeder # 6   36.0 Mix %     2.6 Moist %   Mix Temp Set      320 Deg    *
*  Feeder # 7   28.4 Mix %     4.9 Moist %                                *
*                                                                         *
*  R.A.P.       14.2 Mix %     6.2 Moist %     4.0 A.C. %                 *
*                                                                         *
*  A.C.          5.3 Mix %                                                *
*                                                                         *
*                                                                         *
*             ------                                                      *
*     Total   100.0 %                      Additive   0.00 Mix %          *
*                                                                         *
*                                                                         *
**************************************************************************


**************************************************************************
*                                                                         *
*                          Lehman - Roberts                               *
*        09-03-91                                           12:35:56      *
*                        Plant Status Report                              *
*                                                                         *
**************************************************************************
*                Rate   Units                 Total     Units             *
* -------------------------------------------------------------           *
* Production     351    Tons Per Hour         1582      Tons              *
* Aggregate      285    Tons Per Hour         1223.1    Tons              *
* Total  A.C.    18.8   Tons Per Hour                                     *
* Virgin A.C.    16.9   Tons Per Hour           71.62   Tons              *
*                                                                         *
* R.A.P.  A.C.    1.9   Tons Per Hour                                     *
*                                                                         *
* R.A.P.         47     Tons Per Hour          288.7    Tons              *
*                                                                         *
*                                                                         *
* Additive        0     Lbs  Per Hour                                     *
*                                      Agg. Composite Moisture   4.6 %    *
*                                                                         *
*   Mix     Temperature   316 Deg.     Sling. Position   42 %             *
*   A.C.    Temperature   300 Deg.     Burner Position   48 %             *
*                                      Damper Position   64 %             *
*   Stack   Temperature   263 Deg.                                        *
*                                      B/H Pulse Time    30    Seconds    *
*   Instant Actual A.C.    5.35 %      Negative Press     0.10 Inches     *
```

```
 *
 *          Running Mix # 51
 *                   Name : 411-E
 *          Description : 411-E/W RAP AC-IN RAP 3.5%
 *          ---------------------------------------------------------------------
 *  Feeder # 1    9.5 Mix %     3.4 Moist %   A.C.     On  Time  245 Sec  *
 *  Feeder # 2    0.0 Mix %     2.5 Moist %   A.C.     Off Time  200 Sec  *
 *  Feeder # 3    6.6 Mix %    15.7 Moist %                               *
 *  Feeder # 4    0.0 Mix %    13.7 Moist %                               *
 *  Feeder # 5    0.0 Mix %     2.7 Moist %                               *
 *  Feeder # 6   36.0 Mix %     2.6 Moist %   Mix Temp Set     320 Deg    *
 *  Feeder # 7   28.4 Mix %     4.9 Moist %                               *
 *                                                                        *
 *  R.A.P.       14.2 Mix %     6.2 Moist %     4.0 A.C. %                *
 *                                                                        *
 *  A.C.          5.3 Mix %                                               *
 *                                                                        *
 *                                                                        *
 *               ------                                                   *
 *     Total     100.0 %                     Additive   0.00 Mix %        *
 *                                                                        *
 *                                                                        *
***************************************************************************

        09-03-91  12:37:20  Feeder MAX TPH Calibration Error
```

GASEOUS & PAH'S
Run 2

```
************************************************************************
*                                                                      *
*                       Lehman - Roberts                               *
*       09-03-91                                       12:45:53        *
*                     Plant Status Report                              *
*                                                                      *
************************************************************************
*                  Rate  Units                  Total    Units         *
*  ----------------------------------------------------------          *
* Production      356   Tons Per Hour         1644      Tons           *
* Aggregate       285   Tons Per Hour         1269.9    Tons           *
* Total  A.C.     18.5  Tons Per Hour                                  *
* Virgin A.C.     16.4  Tons Per Hour           74.37   Tons           *
*                                                                      *
* R.A.P.  A.C.     2.1  Tons Per Hour                                  *
*                                                                      *
* R.A.P.           52   Tons Per Hour          300.0    Tons           *
*                                                                      *
*                                                                      *
* Additive          0   Lbs  Per Hour                                  *
*                                  Agg. Composite Moisture    4.6 %    *
*                                                                      *
*   Mix   Temperature   308 Deg.   Sling. Position    42 %             *
*   A.C.  Temperature   301 Deg.   Burner Position    57 %             *
*                                  Damper Position    66 %             *
*   Stack Temperature   261 Deg.                                       *
*                                  B/H Pulse Time     20    Seconds    *
*   Instant Actual A.C.  5.19 %    Negative  Press    0.13  Inches     *
*   Average Actual A.C.  5.29 %    B/H Diff. Press    4.2   Inches     *
************************************************************************
*                                                                      *
*       Running Mix # 51                                               *
*             Name : 411-E                                             *
*       Description : 411-E/W RAP AC IN RAP 3.5%                       *
*       ----------------------------------------------------------     *
*  Feeder # 1   9.5 Mix %    3.4 Moist %   A.C.   On  Time  245 Sec    *
*  Feeder # 2   0.0 Mix %    2.5 Moist %   A.C.   Off Time  200 Sec    *
*  Feeder # 3   6.6 Mix %   15.7 Moist %                               *
*  Feeder # 4   0.0 Mix %   13.7 Moist %                               *
*  Feeder # 5   0.0 Mix %    2.7 Moist %                               *
*  Feeder # 6  36.0 Mix %    2.6 Moist %   Mix Temp Set      320 Deg   *
*  Feeder # 7  28.4 Mix %    4.9 Moist %                               *
*                                                                      *
*  R.A.P.      14.2 Mix %    6.2 Moist %     4.0 A.C. %                *
*                                                                      *
*  A.C.         5.3 Mix %                                              *
*                                                                      *
*                                                                      *
*              ------                                                  *
*    Total    100.0 %                      Additive   0.00 Mix %       *
*                                                                      *
*                                                                      *
************************************************************************
```

```
*************************************************************************
*                                                                       *
*                         Lehman - Roberts                              *
*        09-03-91                                           12:46:18    *
*                       Plant Status Report                             *
*                                                                       *
*************************************************************************
*                 Rate   Units                  Total     Units         *
*  --------------------------------------------------------------       *
* Production       358   Tons Per Hour          1647      Tons          *
* Aggregate        288   Tons Per Hour          1271.8    Tons          *
* Total  A.C.     18.7   Tons Per Hour                                  *
* Virgin A.C.     16.6   Tons Per Hour          74.48     Tons          *
*                                                                       *
* R.A.P.  A.C.     2.1   Tons Per Hour                                  *
*                                                                       *
* R.A.P.            51   Tons Per Hour          300.6     Tons          *
*                                                                       *
*                                                                       *
* Additive           0   Lbs  Per Hour                                  *
*                                       Agg. Composite Moisture  4.6 %  *
*                                                                       *
*   Mix    Temperature   306 Deg.       Sling. Position   42 %          *
*   A.C.   Temperature   301 Deg.       Burner Position   60 %          *
*                                       Damper Position   66 %          *
*   Stack  Temperature   260 Deg.                                       *
*                                       B/H Pulse Time    20   Seconds  *
*   Instant Actual A.C.  5.22 %         Negative  Press   0.13 Inches   *
*   Average Actual A.C.  5.27 %         B/H Diff. Press   4.2  Inches   *
*************************************************************************
*                                                                       *
*          Running Mix # 51                                             *
*                Name : 411-E                                           *
*          Description : 411-E/W RAP AC IN RAP 3.5%                     *
*          ---------------------------------------------------------    *
*  Feeder # 1    9.5 Mix %    3.4 Moist %    A.C.   On  Time  245 Sec   *
*  Feeder # 2    0.0 Mix %    2.5 Moist %    A.C.   Off Time  200 Sec   *
*  Feeder # 3    6.6 Mix %   15.7 Moist %                               *
*  Feeder # 4    0.0 Mix %   13.7 Moist %                               *
*  Feeder # 5    0.0 Mix %    2.7 Moist %                               *
*  Feeder # 6   36.0 Mix %    2.6 Moist %    Mix Temp Set     320 Deg   *
*  Feeder # 7   28.4 Mix %    4.9 Moist %                               *
*                                                                       *
*  R.A.P.       14.2 Mix %    6.2 Moist %     4.0 A.C. %                *
*                                                                       *
*  A.C.          5.3 Mix %                                              *
*                                                                       *
*                                                                       *
*               ------                                                  *
*    Total    100.0 %                      Additive   0.00 Mix %        *
*                                                                       *
*                                                                       *
*************************************************************************

       09-03-91  12:57:15  Feeder MAX TPH Calibration Error
```

09-03-91 13:14:00 Feeder MAX TPH Calibration Error

09-03-91 13:24:26 Feeder MAX TPH Calibration Error

09-03-91 13:35:29 Bin #5 High

09-03-91 13:43:00 Feeder MAX TPH Calibration Error

09-03-91 14:22:51 Bin #5 High

Lehman - Roberts

09-03-91 14:23:33

Plant Status Report

	Rate	Units	Total	Units
Production	376	Tons Per Hour	2307	Tons
Aggregate	305	Tons Per Hour	1779.0	Tons
Total A.C.	19.6	Tons Per Hour		
Virgin A.C.	17.5	Tons Per Hour	104.12	Tons
R.A.P. A.C.	2.1	Tons Per Hour		
R.A.P.	51	Tons Per Hour	422.9	Tons
Additive	0	Lbs Per Hour		

Agg. Composite Moisture 4.6 %

```
*   A.C.     Temperature   304 Deg.    Burner Position    59 %           *
*                                      Damper Position    74 %           *
*   Stack    Temperature   262 Deg.                                      *
*                                      B/H Pulse Time     10   Seconds   *
*   Instant Actual A.C.    5.38 %      Negative  Press    0.13 Inches    *
*   Average Actual A.C.    5.24 %      B/H Diff. Press    3.6  Inches    *
**************************************************************************
*                                                                        *
*         Running Mix # 51                                               *
*                Name : 411-E                                            *
*         Description : 411-E/W RAP AC IN RAP 3.5%                       *
*         ------------------------------------------------------------   *
*  Feeder # 1   9.5 Mix %    3.4 Moist %   A.C.   On  Time  245 Sec      *
*  Feeder # 2   0.0 Mix %    2.5 Moist %   A.C.   Off Time  200 Sec      *
*  Feeder # 3   6.6 Mix %   15.7 Moist %                                 *
*  Feeder # 4   0.0 Mix %   13.7 Moist %                                 *
*  Feeder # 5   0.0 Mix %    2.7 Moist %                                 *
*  Feeder # 6  36.0 Mix %    2.6 Moist %   Mix Temp Set      320 Deg     *
*  Feeder # 7  28.4 Mix %    4.9 Moist %                                 *
*                                                                        *
*  R.A.P.      14.2 Mix %    7.5 Moist %     4.0 A.C. %                  *
*                                                                        *
*  A.C.         5.3 Mix %                                                *
*                                                                        *
*                                                                        *
*             ------                                                     *
*     Total   100.0 %                      Additive   0.00 Mix %         *
*                                                                        *
*                                                                        *
**************************************************************************



**************************************************************************
*                                                                        *
*                            Lehman - Roberts                            *
*        09-03-91                                         14:32:55       *
*                          Plant Status Report                           *
*                                                                        *
**************************************************************************
*                 Rate   Units                Total    Units             *
* --------------------------------------------------------               *
* Production      373    Tons Per Hour        2367     Tons              *
* Aggregate       300    Tons Per Hour        1826.0   Tons              *
* Total  A.C.      19.8  Tons Per Hour                                   *
* Virgin A.C.      17.6  Tons Per Hour        106.86   Tons              *
*                                                                        *
* R.A.P.  A.C.      2.2  Tons Per Hour                                   *
*                                                                        *
* R.A.P.           53    Tons Per Hour        434.3    Tons              *
*                                                                        *
*                                                                        *
* Additive          0    Lbs  Per Hour                                   *
*                                      Agg. Composite Moisture   4.6 %   *
*                                                                        *
*   Mix      Temperature   314 Deg.    Sling. Position    26 %           *
*   A.C.     Temperature   304 Deg.    Burner Position    58 %           *
*                                      Damper Position    74 %           *
*   Stack    Temperature   257 Deg.                                      *
*                                      B/H Pulse Time     10   Seconds   *
*   Instant Actual A.C.    5.30 %      Negative  Press    0.12 Inches    *
*   Average Actual A.C.    5.29 %      B/H Diff. Press    3.7  Inches    *
```

Running Mix # 51
Name : 411-E
Description : 411-E/W RAP AC IN RAP 3.5%

Feeder # 1	9.5 Mix %	3.4 Moist %	A.C.	On Time 245 Sec
Feeder # 2	0.0 Mix %	2.5 Moist %	A.C.	Off Time 200 Sec
Feeder # 3	6.6 Mix %	15.7 Moist %		
Feeder # 4	0.0 Mix %	13.7 Moist %		
Feeder # 5	0.0 Mix %	2.7 Moist %		
Feeder # 6	36.0 Mix %	2.6 Moist %	Mix Temp Set	320 Deg
Feeder # 7	28.4 Mix %	4.9 Moist %		
R.A.P.	14.2 Mix %	7.5 Moist %	4.0 A.C. %	
A.C.	5.3 Mix %			
Total	100.0 %		Additive	0.00 Mix %

Lehman - Roberts

09-03-91 14:42:55

Plant Status Report

	Rate	Units	Total	Units
Production	377	Tons Per Hour	2433	Tons
Aggregate	301	Tons Per Hour	1876.1	Tons
Total A.C.	20.1	Tons Per Hour		
Virgin A.C.	17.8	Tons Per Hour	109.80	Tons
R.A.P. A.C.	2.3	Tons Per Hour		
R.A.P.	56	Tons Per Hour	446.6	Tons
Additive	0	Lbs Per Hour		

Agg. Composite Moisture 4.6 %

Mix Temperature	305 Deg.	Sling. Position	26 %
A.C. Temperature	305 Deg.	Burner Position	60 %
		Damper Position	74 %
Stack Temperature	257 Deg.		
		B/H Pulse Time	10 Seconds
Instant Actual A.C.	5.31 %	Negative Press	0.13 Inches
Average Actual A.C.	5.29 %	B/H Diff. Press	3.7 Inches

Running Mix # 51
Name : 411-E
Description : 411-E/W RAP AC IN RAP 3.5%

```
*  Feeder # 3    6.6 Mix %   15.7 Moist %                                      *
*  Feeder # 4    0.0 Mix %   13.7 Moist %                                      *
*  Feeder # 5    0.0 Mix %    2.7 Moist %                                      *
*  Feeder # 6   36.0 Mix %    2.6 Moist %   Mix Temp Set        320 Deg       *
*  Feeder # 7   28.4 Mix %    4.9 Moist %                                      *
*                                                                              *
*  R.A.P.       14.2 Mix %    7.5 Moist %     4.0 A.C. %                       *
*                                                                              *
*  A.C.          5.3 Mix %                                                     *
*                                                                              *
*                                                                              *
*              ------                                                          *
*     Total    100.0 %                    Additive    0.00 Mix %               *
*                                                                              *
*                                                                              *
********************************************************************************


        09-03-91  14:49:15  Bin #3 High


********************************************************************************
*                                                                              *
*                               Lehman - Roberts                               *
*        09-03-91                                                  14:52:56    *
*                              Plant Status Report                             *
*                                                                              *
********************************************************************************
*                   Rate   Units                  Total     Units              *
*  -----------------------------------------------------------                 *
* Production         381    Tons Per Hour        2498      Tons                *
* Aggregate          307    Tons Per Hour        1926.4    Tons                *
* Total  A.C.       20.0 Tons Per Hour                                         *
* Virgin A.C.       17.8 Tons Per Hour            112.76 Tons                  *
*                                                                              *
* R.A.P.  A.C.       2.2 Tons Per Hour                                         *
*                                                                              *
* R.A.P.             54   Tons Per Hour          458.8    Tons                 *
*                                                                              *
*                                                                              *
* Additive            0   Lbs   Per Hour                                       *
*                                        Agg. Composite Moisture      4.6 %   *
*                                                                              *
*   Mix     Temperature   312 Deg.       Sling. Position      26 %             *
*   A.C.    Temperature   305 Deg.       Burner Position      55 %             *
*                                        Damper Position      70 %             *
*   Stack   Temperature   257 Deg.                                             *
*                                        B/H Pulse Time     10      Seconds   *
*   Instant Actual A.C.    5.24 %        Negative  Press      0.10 Inches     *
*   Average Actual A.C.    5.29 %        B/H Diff. Press      3.4  Inches     *
********************************************************************************
*                                                                              *
*           Running Mix # 51                                                   *
*                 Name : 411-E                                                 *
*           Description : 411-E/W RAP AC IN RAP 3.5%                           *
*          ----------------------------------------------------------          *
*  Feeder # 1    9.5 Mix %    3.4 Moist %   A.C.     On  Time   245 Sec       *
*  Feeder # 2    0.0 Mix %    2.5 Moist %   A.C.     Off Time   200 Sec       *
```

```
****************************************************************
*                                                              *
*                    Lehman - Roberts                          *
*       09-03-91                                   15:22:56    *
*                  Plant Status Report                         *
*                                                              *
****************************************************************
*                Rate   Units                 Total   Units    *
* ---------------------------------------------------------    *
* Production     372   Tons Per Hour          2694    Tons     *
* Aggregate      298   Tons Per Hour          2077.1  Tons     *
* Total  A.C.    19.7  Tons Per Hour                           *
* Virgin A.C.    17.5  Tons Per Hour          121.58  Tons     *
*                                                              *
* R.A.P.  A.C.    2.2  Tons Per Hour                           *
*                                                              *
* R.A.P.          54   Tons Per Hour          495.1   Tons     *
*                                                              *
*                                                              *
* Additive         0   Lbs  Per Hour                           *
*                              Agg. Composite Moisture  4.6 %  *
*                                                              *
*   Mix    Temperature   313 Deg.   Sling. Position   26 %     *
*   A.C.   Temperature   305 Deg.   Burner Position   59 %     *
*                                   Damper Position   72 %     *
*   Stack  Temperature   256 Deg.                              *
*                                   B/H Pulse Time    20   Seconds *
*   Instant Actual A.C.  5.29 %     Negative Press   0.11 Inches *
*   Average Actual A.C.  5.29 %     B/H Diff. Press  4.5  Inches *
****************************************************************
*                                                              *
*         Running Mix # 51                                     *
*              Name : 411-E                                    *
*         Description : 411-E/W RAP AC IN RAP 3.5%             *
*         ------------------------------------------------     *
*  Feeder # 1    9.5 Mix %    3.4 Moist %   A.C.   On  Time  245 Sec *
*  Feeder # 2    0.0 Mix %    2.5 Moist %   A.C.   Off Time  200 Sec *
*  Feeder # 3    6.6 Mix %   15.7 Moist %                      *
*  Feeder # 4    0.0 Mix %   13.7 Moist %                      *
*  Feeder # 5    0.0 Mix %    2.7 Moist %                      *
*  Feeder # 6   36.0 Mix %    2.6 Moist %   Mix Temp Set  320 Deg *
*  Feeder # 7   28.4 Mix %    4.9 Moist %                      *
*                                                              *
*  R.A.P.       14.2 Mix %    7.5 Moist %    4.0 A.C. %        *
*                                                              *
*  A.C.          5.3 Mix %                                     *
*                                                              *
*                                                              *
*              ------                                          *
*     Total    100.0 %                   Additive  0.00 Mix %  *
*                                                              *
*                                                              *
****************************************************************
```

```
*  A.C.        5.3 Mix %                                                  *
*                                                                         *
*                                                                         *
*                ------                                                   *
*    Total     100.0 %                       Additive   0.00 Mix %        *
*                                                                         *
*                                                                         *
***************************************************************************


***************************************************************************
*                                                                         *
*                               Lehman - Roberts                          *
*          09-03-91                                         15:12:56      *
*                             Plant Status Report                         *
*                                                                         *
***************************************************************************
*                  Rate    Units                Total    Units            *
* --------------------------------------------------------                *
* Production       377     Tons Per Hour        2629     Tons             *
* Aggregate        305     Tons Per Hour        2027.1   Tons             *
* Total   A.C.     20.0    Tons Per Hour                                  *
* Virgin A.C.      17.9    Tons Per Hour        118.64   Tons             *
*                                                                         *
* R.A.P.  A.C.      2.1    Tons Per Hour                                  *
*                                                                         *
* R.A.P.           52      Tons Per Hour        482.8    Tons             *
*                                                                         *
*                                                                         *
* Additive          0      Lbs  Per Hour                                  *
*                                      Agg. Composite Moisture   4.6 %   *
*                                                                         *
*   Mix     Temperature    306 Deg.    Sling. Position    26 %            *
*   A.C.    Temperature    305 Deg.    Burner Position    59 %            *
*                                      Damper Position    70 %            *
*   Stack   Temperature    254 Deg.                                       *
*                                      B/H Pulse Time     20    Seconds   *
*   Instant Actual A.C.    5.30 %      Negative  Press    0.10  Inches    *
*   Average Actual A.C.    5.29 %      B/H Diff. Press    4.1   Inches    *
***************************************************************************
*                                                                         *
*          Running Mix # 51                                               *
*                Name : 411-E                                             *
*          Description : 411-E/W RAP AC IN RAP 3.5%                       *
*          ------------------------------------------------------------   *
*  Feeder # 1    9.5 Mix %    3.4 Moist %   A.C.    On  Time  245 Sec     *
*  Feeder # 2    0.0 Mix %    2.5 Moist %   A.C.    Off Time  200 Sec     *
*  Feeder # 3    6.6 Mix %   15.7 Moist %                                 *
*  Feeder # 4    0.0 Mix %   13.7 Moist %                                 *
*  Feeder # 5    0.0 Mix %    2.7 Moist %                                 *
*  Feeder # 6   36.0 Mix %    2.6 Moist %   Mix Temp Set     320 Deg      *
*  Feeder # 7   28.4 Mix %    4.9 Moist %                                 *
*                                                                         *
*  R.A.P.       14.2 Mix %    7.5 Moist %     4.0 A.C. %                  *
*                                                                         *
*  A.C.          5.3 Mix %                                                *
*                                                                         *
*                                                                         *
*                ------                                                   *
*    Total     100.0 %                       Additive   0.00 Mix %        *
```

```
****************************************************************************
*                                                                          *
*                          Lehman - Roberts                                *
*        09-03-91                                          15:30:39        *
*                         Plant Status Report                              *
*                                                                          *
****************************************************************************
*                  Rate   Units                  Total    Units            *
*  ---------------------------------------------------------------         *
* Production        379   Tons Per Hour           2745    Tons             *
* Aggregate         304   Tons Per Hour           2116.1  Tons             *
* Total  A.C.      20.1   Tons Per Hour                                    *
* Virgin A.C.      17.9   Tons Per Hour           123.84  Tons             *
*                                                                          *
* R.A.P.  A.C.      2.2   Tons Per Hour                                    *
*                                                                          *
* R.A.P.             55   Tons Per Hour           504.6   Tons             *
*                                                                          *
*                                                                          *
* Additive            0   Lbs  Per Hour                                    *
*                                      Agg. Composite Moisture    4.6 %    *
*                                                                          *
*   Mix     Temperature   294 Deg.     Sling. Position    31 %             *
*   A.C.    Temperature   305 Deg.     Burner Position    62 %             *
*                                      Damper Position    66 %             *
*   Stack   Temperature   251 Deg.                                         *
*                                      B/H Pulse Time     20    Seconds    *
*   Instant Actual A.C.   5.30 %       Negative  Press    0.08  Inches     *
*   Average Actual A.C.   5.29 %       B/H Diff. Press    3.8   Inches     *
****************************************************************************
*                                                                          *
*           Running Mix # 51                                               *
*                 Name : 411-E                                             *
*           Description : 411-E/W RAP AC IN RAP 3.5%                       *
*           ------------------------------------------------------         *
*  Feeder # 1    9.5 Mix %     3.4 Moist %    A.C.    On  Time  245 Sec    *
*  Feeder # 2    0.0 Mix %     2.5 Moist %    A.C.    Off Time  200 Sec    *
*  Feeder # 3    6.6 Mix %    15.7 Moist %                                 *
*  Feeder # 4    0.0 Mix %    13.7 Moist %                                 *
*  Feeder # 5    0.0 Mix %     2.7 Moist %                                 *
*  Feeder # 6   36.0 Mix %     2.6 Moist %    Mix Temp Set      320 Deg    *
*  Feeder # 7   28.4 Mix %     4.9 Moist %                                 *
*                                                                          *
*  R.A.P.       14.2 Mix %     7.5 Moist %     4.0 A.C. %                  *
*                                                                          *
*  A.C.          5.3 Mix %                                                 *
*                                                                          *
*                                                                          *
*              ------                                                      *
*    Total     100.0 %                     Additive   0.00 Mix %           *
*                                                                          *
*                                                                          *
****************************************************************************


****************************************************************************
*                                                                          *
*                          Lehman - Roberts                                *
*        09-03-91                                          15:32:15        *
*                         Change to New Mix                                *
*
```

Running Mix # 3
Name : 307-AS
Description : 307-AS LIMESTONE

Feeder # 1	5.7 Mix %	3.4 Moist %	A.C. On Time	210 Sec
Feeder # 2	29.0 Mix %	2.5 Moist %	A.C. Off Time	200 Sec
Feeder # 3	0.0 Mix %	15.7 Moist %		
Feeder # 4	0.0 Mix %	13.7 Moist %		
Feeder # 5	62.0 Mix %	2.7 Moist %		
Feeder # 6	0.0 Mix %	2.6 Moist %	Mix Temp Set	250 Deg
Feeder # 7	0.0 Mix %	4.9 Moist %		
R.A.P.	0.0 Mix %	7.5 Moist %	4.0 A.C. %	
A.C.	3.3 Mix %			
Total	100.0 %		Additive	0.00 Mix %

09-03-91 15:32:17 Change Mix On

09-03-91 15:33:39 Bin #5 High

GASEOUS & PART
Run 3

```
**********************************************************************
*                                                                    *
*                        Lehman - Roberts                            *
*         09-03-91                                  16:39:58         *
*                      Plant Status Report                           *
*                                                                    *
**********************************************************************
*                Rate   Units               Total    Units           *
* ---------------------------------------------------------          *
* Production      379   Tons Per Hour        3183    Tons            *
* Aggregate       304   Tons Per Hour        2505.3  Tons            *
* Total  A.C.     19.8  Tons Per Hour                                *
* Virgin A.C.     17.6  Tons Per Hour        140.53 Tons             *
*                                                                    *
* R.A.P.  A.C.     2.2  Tons Per Hour                                *
*                                                                    *
* R.A.P.           55   Tons Per Hour        537.4  Tons             *
*                                                                    *
*                                                                    *
* Additive          0   Lbs  Per Hour                                *
*                                  Agg. Composite Moisture   4.6 %  *
*                                                                    *
*   Mix    Temperature   308 Deg.     Sling. Position   24 %         *
*   A.C.   Temperature   307 Deg.     Burner Position   77 %         *
*                                     Damper Position   79 %         *
*   Stack  Temperature   272 Deg.                                    *
*                                     B/H Pulse Time    10   Seconds *
*   Instant Actual A.C.   5.21 %      Negative  Press   0.28 Inches  *
*   Average Actual A.C.   5.30 %      B/H Diff. Press   3.8  Inches  *
**********************************************************************
*                                                                    *
*          Running Mix # 51                                          *
*               Name : 411-E                                         *
*          Description : 411-E/W RAP AC IN RAP 3.5%                  *
*          ------------------------------------------------------    *
*  Feeder # 1   9.5 Mix %    3.4 Moist %   A.C.   On  Time  245 Sec  *
*  Feeder # 2   0.0 Mix %    2.5 Moist %   A.C.   Off Time  200 Sec  *
*  Feeder # 3   6.6 Mix %   15.7 Moist %                             *
*  Feeder # 4   0.0 Mix %   13.7 Moist %                             *
*  Feeder # 5   0.0 Mix %    2.7 Moist %                             *
*  Feeder # 6  36.0 Mix %    2.6 Moist %   Mix Temp Set     320 Deg  *
*  Feeder # 7  28.4 Mix %    4.9 Moist %                             *
*                                                                    *
*  R.A.P.      14.2 Mix %    7.5 Moist %    4.0 A.C. %               *
*                                                                    *
*  A.C.         5.3 Mix %                                            *
*                                                                    *
*                                                                    *
*              ------                                                *
*     Total    100.0 %                Additive   0.00 Mix %          *
*                                                                    *
*                                                                    *
**********************************************************************
```

Lehman - Roberts

09-03-91 16:49:56

Plant Status Report

	Rate	Units	Total	Units
Production	364	Tons Per Hour	3248	Tons
Aggregate	296	Tons Per Hour	2555.3	Tons
Total A.C.	19.6	Tons Per Hour		
Virgin A.C.	17.7	Tons Per Hour	143.47	Tons
R.A.P. A.C.	1.9	Tons Per Hour		
R.A.P.	48	Tons Per Hour	549.5	Tons
Additive	0	Lbs Per Hour		

Agg. Composite Moisture 4.6 %

Mix Temperature	324 Deg.	Sling. Position	24 %
A.C. Temperature	307 Deg.	Burner Position	78 %
		Damper Position	73 %
Stack Temperature	264 Deg.		
		B/H Pulse Time	10 Seconds
Instant Actual A.C.	5.34 %	Negative Press	0.25 Inches
Average Actual A.C.	5.29 %	B/H Diff. Press	3.6 Inches

Running Mix # 51
Name : 411-E
Description : 411-E/W RAP AC IN RAP 3.5%

Feeder # 1	9.5 Mix %	3.4 Moist %	A.C. On Time	245 Sec
Feeder # 2	0.0 Mix %	2.5 Moist %	A.C. Off Time	200 Sec
Feeder # 3	6.6 Mix %	15.7 Moist %		
Feeder # 4	0.0 Mix %	13.7 Moist %		
Feeder # 5	0.0 Mix %	2.7 Moist %		
Feeder # 6	36.0 Mix %	2.6 Moist %	Mix Temp Set	320 Deg
Feeder # 7	28.4 Mix %	4.9 Moist %		
R.A.P.	14.2 Mix %	7.5 Moist %	4.0 A.C. %	
A.C.	5.3 Mix %			
Total	100.0 %		Additive	0.00 Mix %

Lehman - Roberts

09-03-91 16:59:59

Plant Status Report

```
*                      Rate    Units                     Total      Units                  *
*  ------------------------------------------------------------------------------          *
*  Production          369    Tons Per Hour             3315       Tons                    *
*  Aggregate           298    Tons Per Hour             2605.5     Tons                    *
*  Total  A.C.         19.6   Tons Per Hour                                                *
*  Virgin A.C.         17.5   Tons Per Hour             146.43     Tons                    *
*                                                                                          *
*  R.A.P.  A.C.        2.0    Tons Per Hour                                                *
*                                                                                          *
*  R.A.P.              51     Tons Per Hour             561.9      Tons                    *
*                                                                                          *
*                                                                                          *
*  Additive            0      Lbs  Per Hour                                                *
*                                              Agg. Composite Moisture    4.6 %            *
*                                                                                          *
*    Mix      Temperature    316 Deg.          Sling. Position      24 %                   *
*    A.C.     Temperature    307 Deg.          Burner Position      78 %                   *
*                                              Damper Position      79 %                   *
*    Stack    Temperature    268 Deg.                                                      *
*                                              B/H Pulse Time       10     Seconds         *
*    Instant Actual A.C.     5.29 %            Negative  Press      0.28 Inches            *
*    Average Actual A.C.     5.29 %            B/H Diff. Press      3.9  Inches            *
********************************************************************************************
*                                                                                          *
*              Running Mix # 51                                                            *
*                     Name : 411-E                                                         *
*              Description : 411-E/W RAP AC IN RAP 3.5%                                    *
*              -----------------------------------------------------------------           *
*   Feeder # 1    9.5 Mix %     3.4 Moist %     A.C.    On  Time   245 Sec                 *
*   Feeder # 2    0.0 Mix %     2.5 Moist %     A.C.    Off Time   200 Sec                 *
*   Feeder # 3    6.6 Mix %    15.7 Moist %                                                *
*   Feeder # 4    0.0 Mix %    13.7 Moist %                                                *
*   Feeder # 5    0.0 Mix %     2.7 Moist %                                                *
*   Feeder # 6   36.0 Mix %     2.6 Moist %     Mix Temp Set       320 Deg                 *
*   Feeder # 7   28.4 Mix %     4.9 Moist %                                                *
*                                                                                          *
*   R.A.P.       14.2 Mix %     7.5 Moist %       4.0 A.C. %                               *
*                                                                                          *
*   A.C.          5.3 Mix %                                                                *
*                                                                                          *
*                                                                                          *
*                ------                                                                    *
*     Total     100.0 %                         Additive   0.00 Mix %                      *
*                                                                                          *
*                                                                                          *
********************************************************************************************

********************************************************************************************
*                                                                                          *
*                                    Lehman - Roberts                                      *
*          09-03-91                                                     17:09:59           *
*                                  Plant Status Report                                     *
*                                                                                          *
********************************************************************************************
*                      Rate    Units                     Total      Units                  *
*  ------------------------------------------------------------------------------          *
*  Production          383    Tons Per Hour             3380       Tons                    *
*  Aggregate           310    Tons Per Hour             2656.0     Tons                    *
*  Total  A.C.         20.0   Tons Per Hour                                                *
```

```
* R.A.P.  A.C.        2.2 Tons Per Hour                                    *
*                                                                          *
* R.A.P.              53   Tons Per Hour        574.2  Tons                *
*                                                                          *
*                                                                          *
* Additive            0    Lbs  Per Hour                                   *
*                                          Agg. Composite Moisture  4.6 %  *
*                                                                          *
*   Mix     Temperature     325 Deg.       Sling. Position     24 %        *
*   A.C.    Temperature     307 Deg.       Burner Position     81 %        *
*                                          Damper Position     75 %        *
*   Stack   Temperature     270 Deg.                                       *
*                                          B/H Pulse Time      10   Seconds *
*   Instant Actual A.C.     5.22 %         Negative  Press     0.24 Inches *
*   Average Actual A.C.     5.29 %         B/H Diff. Press     3.8  Inches *
****************************************************************************
*                                                                          *
*            Running Mix # 51                                              *
*                   Name : 411-E                                           *
*            Description : 411-E/W RAP AC IN RAP 3.5%                      *
*            ----------------------------------------------------------    *
*  Feeder # 1    9.5 Mix %     3.4 Moist %    A.C.     On  Time  245 Sec   *
*  Feeder # 2    0.0 Mix %     2.5 Moist %    A.C.     Off Time  200 Sec   *
*  Feeder # 3    6.6 Mix %    15.7 Moist %                                 *
*  Feeder # 4    0.0 Mix %    13.7 Moist %                                 *
*  Feeder # 5    0.0 Mix %     2.7 Moist %                                 *
*  Feeder # 6   36.0 Mix %     2.6 Moist %    Mix Temp Set      320 Deg    *
*  Feeder # 7   28.4 Mix %     4.9 Moist %                                 *
*                                                                          *
*  R.A.P.       14.2 Mix %     7.5 Moist %      4.0 A.C. %                 *
*                                                                          *
*  A.C.          5.3 Mix %                                                 *
*                                                                          *
*                                                                          *
*              ------                                                      *
*    Total    100.0 %                          Additive   0.00 Mix %       *
*                                                                          *
*                                                                          *
****************************************************************************



        09-03-91   17:16:14   Bin #5 High



****************************************************************************
*                                                                          *
*                              Lehman - Roberts                            *
*        09-03-91                                          17:19:57        *
*                            Plant Status Report                           *
*                                                                          *
****************************************************************************
*                    Rate    Units                  Total    Units         *
*  ---------------------------------------------------------------         *
* Production          373    Tons Per Hour          3445     Tons          *
* Aggregate           301    Tons Per Hour          2706.2   Tons          *
* Total  A.C.         19.7   Tons Per Hour                                 *
* Virgin A.C.         17.6   Tons Per Hour          152.30   Tons          *
```

```
*                                                                          *
* R.A.P.            52    Tons Per Hour        586.2  Tons                 *
*                                                                          *
*                                                                          *
* Additive           0    Lbs   Per Hour                                   *
*                                          Agg. Composite Moisture   4.6 % *
*                                                                          *
*   Mix      Temperature   321 Deg.        Sling. Position     24 %        *
*   A.C.     Temperature   307 Deg.        Burner Position     76 %        *
*                                          Damper Position     84 %        *
*   Stack    Temperature   272 Deg.                                        *
*                                          B/H Pulse Time      10   Seconds *
*   Instant Actual A.C.    5.28 %          Negative  Press     0.20 Inches *
*   Average Actual A.C.    5.29 %          B/H Diff. Press     4.1  Inches *
****************************************************************************
*                                                                          *
*              Running Mix # 51                                            *
*                     Name : 411-E                                         *
*              Description : 411-E/W RAP AC IN RAP 3.5%                    *
*              ---------------------------------------------------------   *
*  Feeder # 1    9.5 Mix %    3.4 Moist %    A.C.     On  Time  245 Sec    *
*  Feeder # 2    0.0 Mix %    2.5 Moist %    A.C.     Off Time  200 Sec    *
*  Feeder # 3    6.6 Mix %   15.7 Moist %                                  *
*  Feeder # 4    0.0 Mix %   13.7 Moist %                                  *
*  Feeder # 5    0.0 Mix %    2.7 Moist %                                  *
*  Feeder # 6   36.0 Mix %    2.6 Moist %    Mix Temp Set      320 Deg     *
*  Feeder # 7   28.4 Mix %    4.9 Moist %                                  *
*                                                                          *
*  R.A.P.       14.2 Mix %    7.5 Moist %      4.0 A.C. %                  *
*                                                                          *
*  A.C.          5.3 Mix %                                                 *
*                                                                          *
*                                                                          *
*               ------                                                     *
*     Total    100.0 %                        Additive   0.00 Mix %        *
*                                                                          *
*                                                                          *
****************************************************************************


        09-03-91   17:28:39   Bin #4 High


****************************************************************************
*                                                                          *
*                              Lehman - Roberts                            *
*        09-03-91                                            17:29:59      *
*                             Plant Status Report                          *
*                                                                          *
****************************************************************************
*                Rate   Units                  Total    Units              *
* -----------------------------------------------------------------        *
* Production     370    Tons Per Hour          3511     Tons               *
* Aggregate      298    Tons Per Hour          2756.2   Tons               *
* Total   A.C.    19.7  Tons Per Hour                                      *
* Virgin A.C.     17.6  Tons Per Hour          155.26   Tons               *
*                                                                          *
```

* R.A.P. 52 Tons Per Hour 598.2 Tons

* Additive 0 Lbs Per Hour

Agg. Composite Moisture 4.6 %

Mix Temperature	308 Deg.		Sling. Position	24 %
A.C. Temperature	308 Deg.		Burner Position	73 %
			Damper Position	78 %
Stack Temperature	257 Deg.			
			B/H Pulse Time	15 Seconds
Instant Actual A.C.	5.33 %		Negative Press	0.19 Inches
Average Actual A.C.	5.29 %		B/H Diff. Press	4.3 Inches

Running Mix # 51

Name : 411-E

Description : 411-E/W RAP AC IN RAP 3.5%

Feeder # 1	9.5 Mix %	3.4 Moist %	A.C. On Time	245 Sec
Feeder # 2	0.0 Mix %	2.5 Moist %	A.C. Off Time	200 Sec
Feeder # 3	6.6 Mix %	15.7 Moist %		
Feeder # 4	0.0 Mix %	13.7 Moist %		
Feeder # 5	0.0 Mix %	2.7 Moist %		
Feeder # 6	36.0 Mix %	2.6 Moist %	Mix Temp Set	320 Deg
Feeder # 7	28.4 Mix %	4.9 Moist %		
R.A.P.	14.2 Mix %	7.5 Moist %	4.0 A.C. %	
A.C.	5.3 Mix %			
Total	100.0 %		Additive	0.00 Mix %

09-03-91 17:31:00 Rotary Batcher Not Located

09-03-91 17:31:17 Rotary Batcher Not Located

09-03-91 17:31:34 Bin Top Conveyor Right Overtravel

Lehman - Roberts

Plant Status Report

	Rate	Units	Total	Units
Production	400	Tons Per Hour	3576	Tons
Aggregate	328	Tons Per Hour	2807.2	Tons
Total A.C.	20.0	Tons Per Hour		
Virgin A.C.	17.9	Tons Per Hour	158.20	Tons
R.A.P. A.C.	2.1	Tons Per Hour		
R.A.P.	52	Tons Per Hour	610.6	Tons
Additive	0	Lbs Per Hour		

Agg. Composite Moisture 4.6 %

Mix Temperature	301 Deg.	Sling. Position	24 %
A.C. Temperature	309 Deg.	Burner Position	76 %
		Damper Position	75 %
Stack Temperature	255 Deg.		
		B/H Pulse Time	15 Seconds
Instant Actual A.C.	5.00 %	Negative Press	0.21 Inches
Average Actual A.C.	5.29 %	B/H Diff. Press	4.3 Inches

Running Mix # 51
Name : 411-E
Description : 411-E/W RAP AC IN RAP 3.5%

Feeder # 1	9.5 Mix %	3.4 Moist %	A.C. On Time	245 Sec
Feeder # 2	0.0 Mix %	2.5 Moist %	A.C. Off Time	200 Sec
Feeder # 3	6.6 Mix %	15.7 Moist %		
Feeder # 4	0.0 Mix %	13.7 Moist %		
Feeder # 5	0.0 Mix %	2.7 Moist %		
Feeder # 6	36.0 Mix %	2.6 Moist %	Mix Temp Set	320 Deg
Feeder # 7	28.4 Mix %	4.9 Moist %		
R.A.P.	14.2 Mix %	7.5 Moist %	4.0 A.C. %	
A.C.	5.3 Mix %			
Total	100.0 %		Additive 0.00 Mix %	

09-03-91 17:43:40 Bin #2 Low

Lehman - Roberts

09-03-91 17:44:33

	Rate	Units	Total	Units
Production	371	Tons Per Hour	3606	Tons
Aggregate	300	Tons Per Hour	2830.1	Tons
Total A.C.	19.6	Tons Per Hour		
Virgin A.C.	17.7	Tons Per Hour	159.55	Tons
R.A.P. A.C.	2.1	Tons Per Hour		
R.A.P.	51	Tons Per Hour	616.2	Tons
Additive	0	Lbs Per Hour		

Agg. Composite Moisture 4.6 %

Mix Temperature	314 Deg.	Sling. Position	24 %	
A.C. Temperature	309 Deg.	Burner Position	72 %	
		Damper Position	79 %	
Stack Temperature	264 Deg.			
		B/H Pulse Time	15	Seconds
Instant Actual A.C.	5.33 %	Negative Press	0.21	Inches
Average Actual A.C.	5.29 %	B/H Diff. Press	4.5	Inches

Running Mix # 51
Name : 411-E
Description : 411-E/W RAP AC IN RAP 3.5%

	Mix %	Moist %		
Feeder # 1	9.5 Mix %	3.4 Moist %	A.C. On Time	245 Sec
Feeder # 2	0.0 Mix %	2.5 Moist %	A.C. Off Time	200 Sec
Feeder # 3	6.6 Mix %	15.7 Moist %		
Feeder # 4	0.0 Mix %	13.7 Moist %		
Feeder # 5	0.0 Mix %	2.7 Moist %		
Feeder # 6	36.0 Mix %	2.6 Moist %	Mix Temp Set	320 Deg
Feeder # 7	28.4 Mix %	4.9 Moist %		
R.A.P.	14.2 Mix %	7.5 Moist %	4.0 A.C. %	
A.C.	5.3 Mix %			
Total	100.0 %		Additive	0.00 Mix %

Run 1

Formaldehyde

09-30-91 09:56:25 Bin #5 High

09-30-91 10:29:40 Bin #5 Low

09-30-91 10:36:22 Feeder MAX TPH Calibration Error

09-30-91 10:37:18 Bin #4 High

```
*******************************************************************************
*                                                                             *
*                          Lehman - Roberts                                   *
*       09-30-91                                                  10:50:51    *
*                        Plant Status Report                                  *
*                                                                             *
*******************************************************************************
*                  Rate    Units                    Total     Units           *
* -----------------------------------------------------------------           *
* Production        299    Tons Per Hour             682      Tons            *
* Aggregate         243    Tons Per Hour             527.2    Tons            *
* Total  A.C.      15.8    Tons Per Hour                                      *
* Virgin A.C.      14.2    Tons Per Hour             30.78    Tons            *
*                                                                             *
* R.A.P.  A.C.      1.6    Tons Per Hour                                      *
*                                                                             *
* R.A.P.             40    Tons Per Hour             125.4    Tons            *
*                                                                             *
*                                                                             *
* Additive            0    Lbs  Per Hour                                      *
*                                         Agg. Composite Moisture   4.6 %     *
*                                                                             *
*   Mix     Temperature    314 Deg.       Sling. Position    70 %             *
*   A.C.    Temperature    297 Deg.       Burner Position    35 %             *
*                                         Damper Position    55 %             *
*   Stack   Temperature    248 Deg.                                           *
*                                         B/H Pulse Time     35    Seconds    *
*   Instant Actual A.C.    5.28 %         Negative  Press    0.18  Inches     *
*   Average Actual A.C.    5.28 %         B/H Diff. Press    3.5   Inches     *
*******************************************************************************
*                                                                             *
*         Running Mix # 51                                                    *
```

```
*  Feeder # 1   9.5 Mix %    3.4 Moist %  A.C.    On  Time  245 Sec  *
*  Feeder # 2   0.0 Mix %    2.5 Moist %  A.C.    Off Time  200 Sec  *
*  Feeder # 3   6.6 Mix %   15.7 Moist %                              *
*  Feeder # 4   0.0 Mix %   13.7 Moist %                              *
*  Feeder # 5   0.0 Mix %    2.7 Moist %                              *
*  Feeder # 6  36.0 Mix %    2.6 Moist %  Mix Temp Set     320 Deg    *
*  Feeder # 7  28.4 Mix %    4.9 Moist %                              *
*                                                                     *
*  R.A.P.      14.2 Mix %    7.5 Moist %     4.0 A.C. %               *
*                                                                     *
*  A.C.         5.3 Mix %                                             *
*                                                                     *
*                                                                     *
*              ------                                                 *
*     Total    100.0 %                    Additive   0.00 Mix %       *
*                                                                     *
*                                                                     *
***********************************************************************


***********************************************************************
*                                                                     *
*                          Lehman - Roberts                           *
*        09-30-91                                        11:00:17     *
*                         Plant Status Report                         *
*                                                                     *
***********************************************************************
*                   Rate   Units                 Total    Units       *
* ---------------------------------------------------------           *
* Production        304    Tons Per Hour         731      Tons        *
* Aggregate         244    Tons Per Hour         565.1    Tons        *
* Total  A.C.        16.1  Tons Per Hour                              *
* Virgin A.C.        14.3  Tons Per Hour          33.02   Tons        *
*                                                                     *
* R.A.P.  A.C.        1.8  Tons Per Hour                              *
*                                                                     *
* R.A.P.             44    Tons Per Hour         134.2    Tons        *
*                                                                     *
*                                                                     *
* Additive            0    Lbs  Per Hour                              *
*                                   Agg. Composite Moisture    4.6 %  *
*                                                                     *
*   Mix     Temperature   320 Deg.  Sling. Position    70 %           *
*   A.C.    Temperature   301 Deg.  Burner Position    33 %           *
*                                   Damper Position    55 %           *
*   Stack   Temperature   245 Deg.                                    *
*                                   B/H Pulse Time     35     Seconds *
*   Instant Actual A.C.   5.29 %    Negative  Press    0.18 Inches    *
*   Average Actual A.C.   5.29 %    B/H Diff. Press    3.6  Inches    *
***********************************************************************
*                                                                     *
*          Running Mix # 51                                           *
*                Name : 411-E                                         *
*          Description : 411-E/W RAP AC IN RAP 3.5%                   *
*                                                                     *
*  Feeder # 1   9.5 Mix %    3.4 Moist %  A.C.    On  Time  245 Sec  *
*  Feeder # 2   0.0 Mix %    2.5 Moist %  A.C.    Off Time  200 Sec  *
*  Feeder # 3   6.6 Mix %   15.7 Moist %                              *
*  Feeder # 4   0.0 Mix %   13.7 Moist %                              *
*  Feeder # 5   0.0 Mix %    2.7 Moist %                              *
```

```
*
* R.A.P.        14.2 Mix %   7.5 Moist %    4.0 A.C. %                 *
*
* A.C.          5.3 Mix %                                               *
*                                                                       *
*                                                                       *
*               ------                                                  *
*    Total    100.0 %                  Additive   0.00 Mix %            *
*                                                                       *
*                                                                       *
*************************************************************************


      09-30-91   11:01:58  Feeder MAX TPH Calibration Error


      09-30-91   11:06:31  Bin #4 Low


*************************************************************************
*                                                                       *
*                              Lehman - Roberts                         *
*        09-30-91                                         11:10:17      *
*                             Plant Status Report                       *
*                                                                       *
*************************************************************************
*                Rate   Units                 Total    Units            *
* ------------------------------------------------------------          *
* Production      295   Tons Per Hour          785     Tons             *
* Aggregate       237   Tons Per Hour          605.6   Tons             *
* Total  A.C.     15.7  Tons Per Hour                                   *
* Virgin A.C.     14.0  Tons Per Hour           35.37  Tons             *
*                                                                       *
* R.A.P.  A.C.     1.6  Tons Per Hour                                   *
*                                                                       *
* R.A.P.           42   Tons Per Hour          143.8   Tons             *
*                                                                       *
*                                                                       *
* Additive          0   Lbs  Per Hour                                   *
*                                   Agg. Composite Moisture    4.6 %    *
*                                                                       *
*  Mix     Temperature   331 Deg.   Sling. Position    70 %             *
*  A.C.    Temperature   303 Deg.   Burner Position    30 %             *
*                                   Damper Position    55 %             *
*  Stack   Temperature   254 Deg.                                       *
*                                   B/H Pulse Time     35     Seconds   *
*  Instant Actual A.C.   5.30 %     Negative  Press    0.18  Inches     *
*  Average Actual A.C.   5.29 %     B/H Diff.  Press   3.6   Inches     *
*************************************************************************
*                                                                       *
*        Running Mix # 51                                               *
*              Name : 411-E                                             *
*        Description : 411-E/W RAP AC IN RAP 3.5%                       *
*                                                                       *
```

```
*  Feeder # 2   0.0 Mix %     2.5 Moist %    A.C.       Off Time  200 Sec  *
*  Feeder # 3   6.6 Mix %    15.7 Moist %                                  *
*  Feeder # 4   0.0 Mix %    13.7 Moist %                                  *
*  Feeder # 5   0.0 Mix %     2.7 Moist %                                  *
*  Feeder # 6  36.0 Mix %     2.6 Moist %   Mix Temp Set          320 Deg  *
*  Feeder # 7  28.4 Mix %     4.9 Moist %                                  *
*                                                                          *
*  R.A.P.      14.2 Mix %     7.5 Moist %      4.0 A.C. %                  *
*                                                                          *
*  A.C.         5.3 Mix %                                                  *
*                                                                          *
*                                                                          *
*             ------                                                       *
*     Total   100.0 %                   Additive    0.00 Mix %             *
*                                                                          *
*                                                                          *
****************************************************************************


       09-30-91   11:11:45  Bin #5 High


       09-30-91   11:17:43  Feeder MAX TPH Calibration Error


****************************************************************************
*                                                                          *
*                              Lehman - Roberts                            *
*        09-30-91                                          11:20:17        *
*                            Plant Status Report-                          *
*                                                                          *
****************************************************************************
*               Rate   Units              Total    Units                   *
*  -------------------------------------------------                       *
* Production    296   Tons Per Hour        835     Tons                    *
* Aggregate     240   Tons Per Hour        645.3   Tons                    *
* Total  A.C.    15.5 Tons Per Hour                                        *
* Virgin A.C.    13.9 Tons Per Hour         37.71 Tons                     *
*                                                                          *
* R.A.P.  A.C.    1.6 Tons Per Hour                                        *
*                                                                          *
* R.A.P.         40   Tons Per Hour        153.2   Tons                    *
*                                                                          *
*                                                                          *
* Additive        0   Lbs  Per Hour                                        *
*                                      Agg. Composite Moisture      4.6 %  *
*                                                                          *
*   Mix     Temperature   322 Deg.     Sling. Position     70 %            *
*   A.C.    Temperature   304 Deg.     Burner Position     33 %            *
*                                      Damper Position     55 %            *
*   Stack   Temperature   249 Deg.                                         *
*                                      B/H Pulse Time      35     Seconds  *
*   Instant Actual A.C.    5.23 %      Negative  Press      0.19 Inches    *
*   Average Actual A.C.    5.29 %      B/H Diff. Press      3.4  Inches    *
****************************************************************************
```

```
*                      Name : 411-E                                                  *
*               Description : 411-E/W RAP AC IN RAP 3.5%                             *
*                      -------------------------------------------------------------- *
*  Feeder # 1    9.5 Mix %     3.4 Moist %   A.C.      On  Time  245 Sec    *
*  Feeder # 2    0.0 Mix %     2.5 Moist %   A.C.      Off Time  200 Sec    *
*  Feeder # 3    6.6 Mix %    15.7 Moist %                                  *
*  Feeder # 4    0.0 Mix %    13.7 Moist %                                  *
*  Feeder # 5    0.0 Mix %     2.7 Moist %                                  *
*  Feeder # 6   36.0 Mix %     2.6 Moist %   Mix Temp Set       320 Deg     *
*  Feeder # 7   28.4 Mix %     4.9 Moist %                                  *
*                                                                           *
*  R.A.P.       14.2 Mix %     7.5 Moist %      4.0 A.C. %                  *
*                                                                           *
*  A.C.          5.3 Mix %                                                  *
*                                                                           *
*                                                                           *
*               ------                                                      *
*     Total    100.0 %                       Additive    0.00 Mix %         *
*                                                                           *
*                                                                           *
*****************************************************************************


*****************************************************************************
*                                                                           *
*                               Lehman - Roberts                            *
*          09-30-91                                            11:30:18     *
*                              Plant Status Report                          *
*                                                                           *
*****************************************************************************
*                      Rate   Units                   Total     Units       *
* ---------------------------------------------------------------------     *
* Production           298    Tons Per Hour           888       Tons        *
* Aggregate            241    Tons Per Hour           686.2     Tons        *
* Total   A.C.          15.6  Tons Per Hour                                 *
* Virgin A.C.           14.0  Tons Per Hour            40.10    Tons        *
*                                                                           *
* R.A.P.   A.C.          1.7  Tons Per Hour                                 *
*                                                                           *
* R.A.P.               41     Tons Per Hour           162.7     Tons        *
*                                                                           *
*                                                                           *
* Additive              0     Lbs   Per Hour                                *
*                                           Agg. Composite Moisture   4.6 % *
*                                                                           *
*   Mix     Temperature    323 Deg.         Sling. Position    70 %         *
*   A.C.    Temperature    304 Deg.         Burner Position    33 %         *
*                                           Damper Position    55 %         *
*   Stack   Temperature    254 Deg.                                         *
*                                           B/H Pulse Time     35   Seconds *
*   Instant Actual A.C.    5.25 %           Negative  Press    0.17 Inches  *
*   Average Actual A.C.    5.29 %           B/H Diff. Press    3.6  Inches  *
*****************************************************************************
*                                                                           *
*          Running Mix # 51                                                 *
*                      Name : 411-E                                         *
*               Description : 411-E/W RAP AC IN RAP 3.5%                    *
*                      --------------------------------------------------   *
*  Feeder # 1    9.5 Mix %     3.4 Moist %   A.C.      On  Time  245 Sec    *
*  Feeder # 2    0.0 Mix %     2.5 Moist %   A.C.      Off Time  200 Sec    *
```

```
*  Feeder # 4    0.0 Mix %   13.7 Moist %                                 *
*  Feeder # 5    0.0 Mix %    2.7 Moist %                                 *
*  Feeder # 6   36.0 Mix %    2.6 Moist %   Mix Temp Set       320 Deg    *
*  Feeder # 7   28.4 Mix %    4.9 Moist %                                 *
*                                                                         *
*  R.A.P.       14.2 Mix %    7.5 Moist %      4.0 A.C. %                 *
*                                                                         *
*  A.C.          5.3 Mix %                                                *
*                                                                         *
*                                                                         *
*              ------                                                     *
*     Total    100.0 %                  Additive   0.00 Mix %             *
*                                                                         *
*                                                                         *
***************************************************************************

***************************************************************************
*                                                                         *
*                            Lehman - Roberts                             *
*        09-30-91                                        11:40:18         *
*                           Plant Status Report                           *
*                                                                         *
***************************************************************************
*                  Rate   Units                  Total    Units           *
* -----------------------------------------------------------------       *
* Production       297    Tons Per Hour          941      Tons            *
* Aggregate        239    Tons Per Hour          725.8    Tons            *
* Total  A.C.      15.8   Tons Per Hour                                   *
* Virgin A.C.      14.1   Tons Per Hour           42.45   Tons            *
*                                                                         *
* R.A.P.  A.C.      1.7   Tons Per Hour                                   *
*                                                                         *
* R.A.P.            42    Tons Per Hour          172.1    Tons            *
*                                                                         *
*                                                                         *
* Additive           0    Lbs  Per Hour                                   *
*                                      Agg. Composite Moisture    4.6 %  *
*                                                                         *
*   Mix     Temperature   328 Deg.     Sling. Position     70 %           *
*   A.C.    Temperature   304 Deg.     Burner Position     34 %           *
*                                      Damper Position     55 %           *
*   Stack   Temperature   259 Deg.                                        *
*                                      B/H Pulse Time      35    Seconds  *
*   Instant Actual A.C.    5.31 %      Negative  Press    0.18 Inches     *
*   Average Actual A.C.    5.29 %      B/H Diff. Press     3.6  Inches    *
***************************************************************************
*                                                                         *
*           Running Mix # 51                                              *
*                 Name  : 411-E                                           *
*           Description : 411-E/W RAP AC IN RAP 3.5%                      *
*           ------------------------------------------------------------  *
*  Feeder # 1    9.5 Mix %    3.4 Moist %   A.C.     On  Time   245 Sec   *
*  Feeder # 2    0.0 Mix %    2.5 Moist %   A.C.     Off Time   200 Sec   *
*  Feeder # 3    6.6 Mix %   15.7 Moist %                                 *
*  Feeder # 4    0.0 Mix %   13.7 Moist %                                 *
*  Feeder # 5    0.0 Mix %    2.7 Moist %                                 *
*  Feeder # 6   36.0 Mix %    2.6 Moist %   Mix Temp Set       320 Deg    *
*  Feeder # 7   28.4 Mix %    4.9 Moist %                                 *
*                                                                         *
*  R.A.P.       14.2 Mix %    7.5 Moist %      4.0 A.C. %                 *
```

```
*
*
*                   ------
*      Total     100.0 %                            Additive   0.00 Mix %       *
*                                                                               *
*                                                                               *
*********************************************************************************



*********************************************************************************
*                                                                               *
*                                 Lehman - Roberts                              *
*              09-30-91                                           11:50:19      *
*                               Plant Status Report                             *
*                                                                               *
*********************************************************************************
*                   Rate   Units                  Total     Units               *
*  -----------------------------------------------------------                  *
* Production        292    Tons Per Hour          992       Tons                *
* Aggregate         237    Tons Per Hour          766.4     Tons                *
* Total   A.C.      15.8   Tons Per Hour                                        *
* Virgin A.C.       14.2   Tons Per Hour          44.82     Tons                *
*                                                                               *
* R.A.P.  A.C.      1.6    Tons Per Hour                                        *
*                                                                               *
* R.A.P.            39     Tons Per Hour          181.6     Tons                *
*                                                                               *
*                                                                               *
* Additive          0      Lbs  Per Hour                                        *
*                                            Agg. Composite Moisture    4.6 %   *
*                                                                               *
*   Mix     Temperature    317 Deg.          Sling. Position     70 %           *
*   A.C.    Temperature    304 Deg.          Burner Position     34 %           *
*                                            Damper Position     55 %           *
*   Stack   Temperature    257 Deg.                                             *
*                                            B/H Pulse Time      35    Seconds  *
*   Instant Actual A.C.    5.39 %            Negative  Press     0.18  Inches   *
*   Average Actual A.C.    5.29 %            B/H Diff. Press     3.6   Inches   *
*********************************************************************************
*                                                                               *
*          Running Mix # 51                                                     *
*                 Name : 411-E                                                  *
*          Description : 411-E/W RAP AC IN RAP 3.5%                             *
*          ------------------------------------------------------------         *
*   Feeder # 1   9.5 Mix %    3.4 Moist %   A.C.    On  Time   245 Sec          *
*   Feeder # 2   0.0 Mix %    2.5 Moist %   A.C.    Off Time   200 Sec          *
*   Feeder # 3   6.6 Mix %   15.7 Moist %                                       *
*   Feeder # 4   0.0 Mix %   13.7 Moist %                                       *
*   Feeder # 5   0.0 Mix %    2.7 Moist %                                       *
*   Feeder # 6  36.0 Mix %    2.6 Moist %   Mix Temp Set       320 Deg          *
*   Feeder # 7  28.4 Mix %    4.9 Moist %                                       *
*                                                                               *
*   R.A.P.      14.2 Mix %    7.5 Moist %     4.0 A.C. %                        *
*                                                                               *
*   A.C.         5.3 Mix %                                                      *
*                                                                               *
*                                                                               *
*               ------                                                          *
*      Total     100.0 %                            Additive   0.00 Mix %       *
*
```

Lehman - Roberts

09-30-91 12:00:18

Plant Status Report

	Rate	Units	Total	Units
Production	296	Tons Per Hour	1043	Tons
Aggregate	238	Tons Per Hour	806.2	Tons
Total A.C.	15.7	Tons Per Hour		
Virgin A.C.	14.0	Tons Per Hour	47.16	Tons
R.A.P. A.C.	1.7	Tons Per Hour		
R.A.P.	42	Tons Per Hour	190.9	Tons
Additive	0	Lbs Per Hour		

Agg. Composite Moisture 4.6 %

Mix	Temperature	323 Deg.	Sling. Position	70 %	
A.C.	Temperature	305 Deg.	Burner Position	31 %	
			Damper Position	55 %	
Stack	Temperature	250 Deg.			
			B/H Pulse Time	35	Seconds
Instant	Actual A.C.	5.30 %	Negative Press	0.21	Inches
Average	Actual A.C.	5.29 %	B/H Diff. Press	3.7	Inches

Running Mix # 51
Name : 411-E
Description : 411-E/W RAP AC IN RAP 3.5%

Feeder # 1	9.5 Mix %	3.4 Moist %	A.C. On Time	245 Sec
Feeder # 2	0.0 Mix %	2.5 Moist %	A.C. Off Time	200 Sec
Feeder # 3	6.6 Mix %	15.7 Moist %		
Feeder # 4	0.0 Mix %	13.7 Moist %		
Feeder # 5	0.0 Mix %	2.7 Moist %		
Feeder # 6	36.0 Mix %	2.6 Moist %	Mix Temp Set	320 Deg
Feeder # 7	28.4 Mix %	4.9 Moist %		
R.A.P.	14.2 Mix %	7.5 Moist %	4.0 A.C. %	
A.C.	5.3 Mix %			
Total	100.0 %		Additive 0.00 Mix %	

09-30-91 12:05:43 Main Flame Failure

09-30-91 12:05:45 Asphalt Valve Recirculate

09-30-91 12:05:47 System Stop

09-30-91 12:11:14 System Start

09-30-91 12:11:16 Preheat Starting

09-30-91 12:14:46 Feeder MAX TPH Calibration Error

09-30-91 12:16:22 Asphalt Deviation

09-30-91 12:17:09 Asphalt Deviation

```
*******************************************************************
*                                                                 *
*                      Lehman - Roberts                           *
*   09-30-91                                            12:22:05  *
*                    Plant Status Report                          *
*                                                                 *
*******************************************************************
*            Rate   Units                Total    Units           *
*  ------------------------------------------------------------  *
* Production    290   Tons Per Hour      1124     Tons            *
* Aggregate     235   Tons Per Hour      868.1    Tons            *
```

```
*  R.A.P.  A.C.        1.6 Tons Per Hour                                   *
*                                                                          *
*  R.A.P.             40   Tons Per Hour        205.6   Tons               *
*                                                                          *
*                                                                          *
*  Additive            0   Lbs  Per Hour                                   *
*                                       Agg. Composite Moisture    4.6 %   *
*                                                                          *
*    Mix    Temperature    321 Deg.     Sling. Position    70 %            *
*    A.C.   Temperature    304 Deg.     Burner Position    30 %            *
*                                       Damper Position    55 %            *
*    Stack  Temperature    261 Deg.                                        *
*                                       B/H Pulse Time     35    Seconds   *
*    Instant Actual A.C.   5.31 %       Negative  Press    0.20  Inches    *
*    Average Actual A.C.  34.04 %       B/H Diff. Press    3.7   Inches    *
****************************************************************************
*                                                                          *
*          Running Mix # 51                                                *
*                 Name : 411-E                                             *
*          Description : 411-E/W RAP AC IN RAP 3.5%                        *
*          ------------------------------------------------------------    *
*   Feeder # 1   9.5 Mix %    3.4 Moist %   A.C.    On  Time  245 Sec      *
*   Feeder # 2   0.0 Mix %    2.5 Moist %   A.C.    Off Time  200 Sec      *
*   Feeder # 3   6.6 Mix %   15.7 Moist %                                  *
*   Feeder # 4   0.0 Mix %   13.7 Moist %                                  *
*   Feeder # 5   0.0 Mix %    2.7 Moist %                                  *
*   Feeder # 6  36.0 Mix %    2.6 Moist %   Mix Temp Set      320 Deg      *
*   Feeder # 7  28.4 Mix %    4.9 Moist %                                  *
*                                                                          *
*   R.A.P.      14.2 Mix %    7.5 Moist %     4.0 A.C. %                   *
*                                                                          *
*   A.C.         5.3 Mix %                                                 *
*                                                                          *
*                                                                          *
*              ------                                                      *
*     Total    100.0 %                  Additive   0.00 Mix %              *
*                                                                          *
*                                                                          *
****************************************************************************


****************************************************************************
*                                                                          *
*                            Lehman - Roberts                              *
*        09-30-91                                           12:32:06       *
*                          Plant Status Report                             *
*                                                                          *
****************************************************************************
*                  Rate   Units                   Total    Units           *
*  -----------------------------------------------------------------       *
*  Production       300   Tons Per Hour           1175     Tons            *
*  Aggregate        243   Tons Per Hour          908.6     Tons            *
*  Total  A.C.     15.8   Tons Per Hour                                    *
*  Virgin A.C.     14.3   Tons Per Hour          53.21     Tons            *
*                                                                          *
*  R.A.P.  A.C.     1.6   Tons Per Hour                                    *
*                                                                          *
*  R.A.P.            41   Tons Per Hour          214.7     Tons            *
*                                                                          *
```

```
 *  Additive                  0  Lbs  Per Hour
 *                                                   Agg. Composite Moisture   4.6 % *
 *                                                                                 *
 *   Mix      Temperature    326 Deg.     Sling. Position     70 %                 *
 *   A.C.     Temperature    305 Deg.     Burner Position     34 %                 *
 *                                        Damper Position     55 %                 *
 *   Stack    Temperature    249 Deg.                                              *
 *                                        B/H Pulse Time      35     Seconds      *
 *   Instant Actual A.C.     5.30 %       Negative  Press      0.18 Inches        *
 *   Average Actual A.C.     5.29 %       B/H Diff. Press      3.6  Inches        *
***********************************************************************************
 *                                                                                 *
 *          Running Mix # 51                                                       *
 *                 Name : 411-E                                                    *
 *          Description : 411-E/W RAP AC IN RAP 3.5%                               *
 *          -----------------------------------------------------------------      *
 *  Feeder # 1    9.5 Mix %     3.4 Moist %    A.C.    On   Time   245 Sec       *
 *  Feeder # 2    0.0 Mix %     2.5 Moist %    A.C.    Off  Time   200 Sec       *
 *  Feeder # 3    6.6 Mix %    15.7 Moist %                                        *
 *  Feeder # 4    0.0 Mix %    13.7 Moist %                                        *
 *  Feeder # 5    0.0 Mix %     2.7 Moist %                                        *
 *  Feeder # 6   36.0 Mix %     2.6 Moist %    Mix Temp Set        320 Deg        *
 *  Feeder # 7   28.4 Mix %     4.9 Moist %                                        *
 *                                                                                 *
 *  R.A.P.       14.2 Mix %     7.5 Moist %     4.0 A.C.  %                        *
 *                                                                                 *
 *  A.C.          5.3 Mix %                                                        *
 *                                                                                 *
 *                                                                                 *
 *              ------                                                             *
 *     Total    100.0 %                        Additive    0.00 Mix %              *
 *                                                                                 *
 *                                                                                 *
***********************************************************************************




***********************************************************************************
 *                                                                                 *
 *                               Lehman - Roberts                                  *
 *         09-30-91                                                12:32:24        *
 *                             Plant Status Report                                 *
 *                                                                                 *
***********************************************************************************
 *                    Rate   Units                   Total    Units                *
 * ---------------------------------------------------------------------           *
 * Production         298   Tons Per Hour            1177     Tons                 *
 * Aggregate          241   Tons Per Hour           909.7     Tons                 *
 * Total  A.C.       15.7   Tons Per Hour              -                           *
 * Virgin A.C.       14.1   Tons Per Hour           53.28     Tons                 *
 *                                                                                 *
 * R.A.P.  A.C.       1.6   Tons Per Hour                                          *
 *                                                                                 *
 * R.A.P.              41   Tons Per Hour           215.0     Tons                 *
 *                                                                                 *
 * Additive             0   Lbs  Per Hour                                          *
 *                                                 Agg. Composite Moisture   4.6 % *
 *                                                                                 *
 *   Mix      Temperature    326 Deg.     Sling. Position     70 %                 *
 *   A.C.     Temperature    305 Deg.     Burner Position     34 %                 *
 *                                        Damper Position     55 %                 *
```

```
*  Instant Actual A.C.   5.28 %     Negative  Press     0.17 Inches  *
*  Average Actual A.C.   5.35 %     B/H Diff. Press     3.5  Inches  *
**********************************************************************
*                                                                    *
*          Running Mix # 51                                          *
*                Name : 411-E                                        *
*          Description : 411-E/W RAP AC IN RAP 3.5%                  *
*          ------------------------------------------------------    *
*  Feeder # 1   9.5 Mix %    3.4 Moist %   A.C.   On  Time  245 Sec  *
*  Feeder # 2   0.0 Mix %    2.5 Moist %   A.C.   Off Time  200 Sec  *
*  Feeder # 3   6.6 Mix %   15.7 Moist %                             *
*  Feeder # 4   0.0 Mix %   13.7 Moist %                             *
*  Feeder # 5   0.0 Mix %    2.7 Moist %                             *
*  Feeder # 6  36.0 Mix %    2.6 Moist %   Mix Temp Set     320 Deg  *
*  Feeder # 7  28.4 Mix %    4.9 Moist %                             *
*                                                                    *
*  R.A.P.      14.2 Mix %    7.5 Moist %     4.0 A.C. %              *
*                                                                    *
*  A.C.         5.3 Mix %                                            *
*                                                                    *
*                                                                    *
*             ------                                                 *
*    Total    100.0 %                  Additive   0.00 Mix %         *
*                                                                    *
*                                                                    *
**********************************************************************
```

RUN 2 Formaldehyde

```
*****************************************************************************
*                                                                           *
*                          Lehman - Roberts                                 *
*          09-30-91                                      13:30:37           *
*                        Plant Status Report                                *
*                                                                           *
*****************************************************************************
*                   Rate   Units                Total    Units              *
*  --------------------------------------------------------                 *
* Production        307    Tons Per Hour        1481     Tons               *
* Aggregate         248    Tons Per Hour        1139.1   Tons               *
* Total  A.C.       16.1   Tons Per Hour                                    *
* Virgin A.C.       14.4   Tons Per Hour        66.51    Tons               *
*                                                                           *
* R.A.P.  A.C.       1.7   Tons Per Hour                                    *
*                                                                           *
* R.A.P.             43    Tons Per Hour        275.5    Tons               *
*                                                                           *
*                                                                           *
* Additive            0    Lbs  Per Hour                                    *
*                                       Agg. Composite Moisture   4.6 %     *
*                                                                           *
*   Mix     Temperature    319 Deg.     Sling. Position     70 %            *
*   A.C.    Temperature    314 Deg.     Burner Position     37 %            *
*                                       Damper Position     59 %            *
*   Stack   Temperature    270 Deg.                                         *
*                                       B/H Pulse Time      20    Seconds   *
*   Instant Actual A.C.    5.24 %       Negative  Press     0.25  Inches    *
*   Average Actual A.C.    5.30 %       B/H Diff. Press     3.4   Inches    *
*****************************************************************************
*                                                                           *
*          Running Mix # 51                                                 *
*                 Name : 411-E                                              *
*          Description : 411-E/W RAP AC IN RAP 3.5%                         *
*          -------------------------------------------------------          *
*   Feeder # 1    9.5 Mix %     3.4 Moist %   A.C.   On  Time  245 Sec      *
*   Feeder # 2    0.0 Mix %     2.5 Moist %   A.C.   Off Time  200 Sec      *
*   Feeder # 3    6.6 Mix %    15.7 Moist %                                 *
*   Feeder # 4    0.0 Mix %    13.7 Moist %                                 *
*   Feeder # 5    0.0 Mix %     2.7 Moist %                                 *
*   Feeder # 6   36.0 Mix %     2.6 Moist %   Mix Temp Set     320 Deg      *
*   Feeder # 7   28.4 Mix %     4.9 Moist %                                 *
*                                                                           *
*   R.A.P.       14.2 Mix %     7.5 Moist %    4.0 A.C. %                   *
*                                                                           *
*   A.C.          5.3 Mix %                                                 *
*                                                                           *
*                                                                           *
*                -----                                                      *
*     Total     100.0 %                     Additive   0.00 Mix %           *
*                                                                           *
*                                                                           *
*****************************************************************************
```

09-30-91 13:32:28 Bin #4 High

Lehman - Roberts

09-30-91 13:40:06

Plant Status Report

	Rate	Units	Total	Units
Production	300	Tons Per Hour	1530	Tons
Aggregate	241	Tons Per Hour	1176.8	Tons
Total A.C.	15.9	Tons Per Hour		
Virgin A.C.	14.2	Tons Per Hour	68.76	Tons
R.A.P. A.C.	1.8	Tons Per Hour		
R.A.P.	43	Tons Per Hour	284.7	Tons
Additive	0	Lbs Per Hour		

Agg. Composite Moisture 4.6 %

Mix Temperature 318 Deg.	Sling. Position	70 %
A.C. Temperature 314 Deg.	Burner Position	34 %
	Damper Position	57 %
Stack Temperature 266 Deg.		
	B/H Pulse Time	20 Seconds
Instant Actual A.C. 5.31 %	Negative Press	0.22 Inches
Average Actual A.C. 5.29 %	B/H Diff. Press	3.3 Inches

Running Mix # 51
Name : 411-E
Description : 411-E/W RAP AC IN RAP 3.5%

	Mix %	Moist %		
Feeder # 1	9.5 Mix %	3.4 Moist %	A.C. On Time	245 Sec
Feeder # 2	0.0 Mix %	2.5 Moist %	A.C. Off Time	200 Sec
Feeder # 3	6.6 Mix %	15.7 Moist %		
Feeder # 4	0.0 Mix %	13.7 Moist %		
Feeder # 5	0.0 Mix %	2.7 Moist %		
Feeder # 6	36.0 Mix %	2.6 Moist %	Mix Temp Set /	320 Deg
Feeder # 7	28.4 Mix %	4.9 Moist %		
R.A.P.	14.2 Mix %	7.5 Moist %	4.0 A.C. %	
A.C.	5.3 Mix %			
Total	100.0 %		Additive 0.00 Mix %	

```
*                                                                         *
*                            Lehman - Roberts                             *
*         09-30-91                                          13:50:05      *
*                           Plant Status Report                           *
*                                                                         *
***************************************************************************
*                    Rate   Units                   Total     Units       *
*   ----------------------------------------------------------------      *
* Production          299   Tons Per Hour            1582     Tons        *
* Aggregate           243   Tons Per Hour            1217.4   Tons        *
* Total  A.C.        15.8   Tons Per Hour                                 *
* Virgin A.C.        14.2   Tons Per Hour            71.12    Tons        *
*                                                                         *
* R.A.P.  A.C.        1.6   Tons Per Hour                                 *
*                                                                         *
* R.A.P.             40     Tons Per Hour            294.3    Tons        *
*                                                                         *
*                                                                         *
* Additive            0     Lbs  Per Hour                                 *
*                                            Agg. Composite Moisture  4.6 % *
*                                                                         *
*   Mix     Temperature    330 Deg.     Sling.  Position     70 %         *
*   A.C.    Temperature    315 Deg.     Burner  Position     33 %         *
*                                       Damper  Position     57 %         *
*   Stack   Temperature    259 Deg.                                       *
*                                       B/H Pulse Time       20   Seconds *
*   Instant Actual A.C.    5.28 %       Negative   Press    0.22  Inches  *
*   Average Actual A.C.    5.29 %       B/H Diff.  Press    3.1   Inches  *
***************************************************************************
*                                                                         *
*            Running Mix # 51                                             *
*                   Name : 411-E                                          *
*            Description : 411-E/W RAP AC IN RAP 3.5%                     *
*            ------------------------------------------------------       *
*   Feeder # 1    9.5 Mix %     3.4 Moist %    A.C.    On   Time  245 Sec *
*   Feeder # 2    0.0 Mix %     2.5 Moist %    A.C.    Off  Time  200 Sec *
*   Feeder # 3    6.6 Mix %    15.7 Moist %                               *
*   Feeder # 4    0.0 Mix %    13.7 Moist %                               *
*   Feeder # 5    0.0 Mix %     2.7 Moist %                               *
*   Feeder # 6   36.0 Mix %     2.6 Moist %    Mix Temp Set       320 Deg *
*   Feeder # 7   28.4 Mix %     4.9 Moist %                               *
*                                                                         *
*   R.A.P.       14.2 Mix %     7.5 Moist %    4.0 A.C. %                 *
*                                                                         *
*   A.C.          5.3 Mix %                                               *
*                                                                         *
*                                                                         *
*                -----                                                    *
*     Total     100.0 %                        Additive   0.00 Mix %      *
*                                                                         *
*                                                                         *
***************************************************************************

***************************************************************************
*                                                                         *
*                            Lehman - Roberts                             *
*         09-30-91                                          14:00:06      *
*                           Plant Status Report                           *
*                                                                         *
```

```
* ---------------------------------------------------------------------- *
* Production      302  Tons Per Hour        1634    Tons                 *
* Aggregate       245  Tons Per Hour        1257.2  Tons                 *
* Total  A.C.    15.6  Tons Per Hour                                     *
* Virgin A.C.    14.0  Tons Per Hour          73.48 Tons                 *
*                                                                        *
* R.A.P.  A.C.    1.6  Tons Per Hour                                     *
*                                                                        *
* R.A.P.          41   Tons Per Hour         303.8  Tons                 *
*                                                                        *
*                                                                        *
* Additive         0   Lbs  Per Hour                                     *
*                                    Agg. Composite Moisture    4.6 %   *
*                                                                        *
*   Mix    Temperature   329 Deg.    Sling. Position    70 %            *
*   A.C.   Temperature   314 Deg.    Burner Position    37 %            *
*                                    Damper Position    57 %            *
*   Stack  Temperature   270 Deg.                                       *
*                                    B/H Pulse Time      20   Seconds   *
*   Instant Actual A.C.   5.16 %     Negative  Press    0.20 Inches     *
*   Average Actual A.C.   5.28 %     B/H Diff. Press    3.1  Inches     *
**************************************************************************
*                                                                        *
*           Running Mix # 51                                             *
*                  Name : 411-E                                          *
*           Description : 411-E/W RAP AC IN RAP 3.5%                     *
*           ----------------------------------------------------------  *
*  Feeder # 1    9.5 Mix %    3.4 Moist %   A.C.   On  Time  245 Sec    *
*  Feeder # 2    0.0 Mix %    2.5 Moist %   A.C.   Off Time  200 Sec    *
*  Feeder # 3    6.6 Mix %   15.7 Moist %                                *
*  Feeder # 4    0.0 Mix %   13.7 Moist %                                *
*  Feeder # 5    0.0 Mix %    2.7 Moist %                                *
*  Feeder # 6   36.0 Mix %    2.6 Moist %   Mix Temp Set      320 Deg   *
*  Feeder # 7   28.4 Mix %    4.9 Moist %                                *
*                                                                        *
*  R.A.P.       14.2 Mix %    7.5 Moist %     4.0 A.C. %                 *
*                                                                        *
*  A.C.          5.3 Mix %                                               *
*                                                                        *
*                                                                        *
*             ------                                                     *
*     Total   100.0 %                        Additive   0.00 Mix %      *
*                                                                        *
*                                                                        *
**************************************************************************

         09-30-91  14:07:02  Bin #5 High

**************************************************************************
*                                                                        *
*                           Lehman - Roberts                             *
*        09-30-91                                          14:10:06      *
*                         Plant Status Report                            *
*                                                                        *
**************************************************************************
```

```
* Production      294  Tons Per Hour      1686     Tons                       *
* Aggregate       236  Tons Per Hour      1297.7   Tons                       *
* Total  A.C.     15.8 Tons Per Hour                                          *
* Virgin A.C.     14.1 Tons Per Hour      75.84 Tons                          *
*                                                                             *
* R.A.P.   A.C.    1.7 Tons Per Hour                                          *
*                                                                             *
* R.A.P.          42   Tons Per Hour      313.3  Tons                         *
*                                                                             *
*                                                                             *
* Additive         0   Lbs  Per Hour                                          *
*                                      Agg. Composite Moisture   4.6 %        *
*                                                                             *
*   Mix     Temperature   338 Deg.     Sling. Position    70 %                *
*   A.C.    Temperature   315 Deg.     Burner Position    31 %                *
*                                      Damper Position    57 %                *
*   Stack   Temperature   254 Deg.                                            *
*                                      B/H Pulse Time:    20    Seconds       *
*   Instant Actual A.C.   5.37 %       Negative Press     0.21 Inches         *
*   Average Actual A.C.   5.29 %       B/H Diff. Press    3.2  Inches         *
*******************************************************************************
*                                                                             *
*          Running Mix # 51                                                   *
*                 Name : 411-E                                                *
*          Description : 411-E/W RAP AC IN RAP 3.5%                           *
*          ---------------------------------------------------------          *
*   Feeder # 1    9.5 Mix %     3.4 Moist %   A.C.     On  Time  245 Sec      *
*   Feeder # 2    0.0 Mix %     2.5 Moist %   A.C.     Off Time  200 Sec      *
*   Feeder # 3    6.6 Mix %    15.7 Moist %                                   *
*   Feeder # 4    0.0 Mix %    13.7 Moist %                                   *
*   Feeder # 5    0.0 Mix %     2.7 Moist %                                   *
*   Feeder # 6   36.0 Mix %     2.6 Moist %   Mix Temp Set       320 Deg      *
*   Feeder # 7   28.4 Mix %     4.9 Moist %                                   *
*                                                                             *
*   R.A.P.       14.2 Mix %     7.5 Moist %     4.0 A.C. %                    *
*                                                                             *
*   A.C.          5.3 Mix %                                                   *
*                                                                             *
*                                                                             *
*              ------                                                         *
*      Total   100.0 %                     Additive   0.00 Mix %              *
*                                                                             *
*                                                                             *
*******************************************************************************



*******************************************************************************
*                                                                             *
*                              Lehman - Roberts                               *
*         09-30-91                                          14:20:06          *
*                              Plant Status Report                            *
*                                                                             *
*******************************************************************************
*                 Rate   Units                   Total    Units               *
*----------------------------------------------------------------             *
* Production      305  Tons Per Hour      1738     Tons                       *
* Aggregate       249  Tons Per Hour      1337.8   Tons                       *
* Total  A.C.     16.0 Tons Per Hour                                          *
* Virgin A.C.     14.4 Tons Per Hour      78.20 Tons                          *
*                                                                             *
```

```
* R.A.P.              40   Tons Per Hour         322.5  Tons                      *
*                                                                               *
*                                                                               *
* Additive             0   Lbs  Per Hour                                         *
*                                              Agg. Composite Moisture   4.6 %  *
*                                                                               *
*   Mix      Temperature    306 Deg.           Sling. Position    70 %          *
*   A.C.     Temperature    317 Deg.           Burner Position    46 %          *
*                                              Damper Position    57 %          *
*   Stack    Temperature    252 Deg.                                            *
*                                              B/H Pulse Time     20    Seconds *
*   Instant Actual A.C.     5.24 %             Negative  Press    0.17  Inches  *
*   Average Actual A.C.     5.29 %             B/H Diff. Press    3.0   Inches  *
*********************************************************************************
*                                                                               *
*             Running Mix # 51                                                  *
*                    Name : 411-E                                               *
*             Description : 411-E/W RAP AC IN RAP 3.5%                          *
*             ------------------------------------------------------------      *
*  Feeder # 1    9.5 Mix %      3.4 Moist %    A.C.     On  Time  245 Sec       *
*  Feeder # 2    0.0 Mix %      2.5 Moist %    A.C.     Off Time  200 Sec       *
*  Feeder # 3    6.6 Mix %     15.7 Moist %                                     *
*  Feeder # 4    0.0 Mix %     13.7 Moist %                                     *
*  Feeder # 5    0.0 Mix %      2.7 Moist %                                     *
*  Feeder # 6   36.0 Mix %      2.6 Moist %    Mix Temp Set          320 Deg    *
*  Feeder # 7   28.4 Mix %      4.9 Moist %                                     *
*                                                                               *
*  R.A.P.       14.2 Mix %      7.5 Moist %      4.0 A.C. %                     *
*                                                                               *
*  A.C.          5.3 Mix %                                                      *
*                                                                               *
*                                                                               *
*             ------                                                            *
*     Total    100.0 %                         Additive   0.00 Mix %            *
*                                                                               *
*                                                                               *
*********************************************************************************




*********************************************************************************
*                                                                               *
*                                Lehman - Roberts                               *
*         09-30-91                                                 14:30:06     *
*                              Plant Status Report                              *
*                                                                               *
*********************************************************************************
*                      Rate   Units                  Total    Units             *
* ------------------------------------------------------------------            *
* Production           298    Tons Per Hour          1790     Tons              *
* Aggregate            241    Tons Per Hour          1378.0   Tons              *
* Total  A.C.         15.6    Tons Per Hour                                     *
* Virgin A.C.         14.0    Tons Per Hour           80.57   Tons              *
*                                                                               *
* R.A.P.  A.C.         1.6    Tons Per Hour                                     *
*                                                                               *
* R.A.P.              41      Tons Per Hour          331.9    Tons              *
*                                                                               *
*                                                                               *
* Additive             0      Lbs  Per Hour                                     *
*                                              Agg. Composite Moisture   4.6 %  *
```

```
*  A.C.    Temperature   318 Deg.     Burner Position    35 %          *
*                                     Damper Position    57 %          *
*  Stack   Temperature   251 Deg.                                      *
*                                     B/H Pulse Time     20   Seconds  *
*  Instant Actual A.C.   5.23 %       Negative  Press    0.16 Inches   *
*  Average Actual A.C.   5.29 %       B/H Diff.  Press   3.0  Inches   *
************************************************************************
*                                                                      *
*            Running Mix # 51                                          *
*                  Name : 411-E                                        *
*            Description : 411-E/W RAP AC IN RAP 3.5%                  *
*            ---------------------------------------------------------*
*  Feeder # 1    9.5 Mix %     3.4 Moist %  A.C.    On  Time  245 Sec  *
*  Feeder # 2    0.0 Mix %     2.5 Moist %  A.C.    Off Time  200 Sec  *
•  Feeder # 3    6.6 Mix %    15.7 Moist %                             *
*  Feeder # 4    0.0 Mix %    13.7 Moist %                             *
*  Feeder # 5    0.0 Mix %     2.7 Moist %                             *
*  Feeder # 6   36.0 Mix %     2.6 Moist %  Mix Temp Set     320 Deg   *
*  Feeder # 7   28.4 Mix %     4.9 Moist %                             *
*                                                                      *
*  R.A.P.       14.2 Mix %     7.5 Moist %    4.0 A.C. %               *
*                                                                      *
*  A.C.          5.3 Mix %                                             *
*                                                                      *
*                                                                      *
*                ------                                                *
*     Total    100.0 %                   Additive   0.00 Mix %         *
*                                                                      *
*                                                                      *
************************************************************************




      09-30-91  14:39:22  Bin #4 High




************************************************************************
*                                                                      *
*                              Lehman - Roberts                        *
*         09-30-91                                        14:40:07     *
*                           Plant Status Report                        *
*                                                                      *
************************************************************************
*                 Rate   Units                  Total   Units          *
* -------------------------------------------------------------        *
* Production      300    Tons Per Hour          1842    Tons           *
* Aggregate       243    Tons Per Hour          1418.4  Tons           *
* Total  A.C.      15.6  Tons Per Hour                                 *
* Virgin A.C.      14.0  Tons Per Hour            82.95 Tons           *
*                                                                      *
* R.A.P.  A.C.      1.7  Tons Per Hour                                 *
*                                                                      *
* R.A.P.           41    Tons Per Hour           341.3  Tons           *
*                                                                      *
*                                                                      *
* Additive          0    Lbs  Per Hour                                 *
*                                   Agg. Composite Moisture   4.6 %    *
*                                                                      *
```

```
*                                                 Damper Position    57 %                *
*  Stack    Temperature    263 Deg.                                                     *
*                                                 B/H Pulse Time      20     Seconds    *
*    Instant Actual A.C.    5.21 %                Negative  Press     0.20 Inches       *
*    Average Actual A.C.    5.29 %                B/H Diff. Press     3.3  Inches       *
****************************************************************************************
*                                                                                      *
*            Running Mix # 51                                                          *
*                   Name : 411-E                                                       *
*            Description : 411-E/W RAP AC IN RAP 3.5%                                  *
*            -------------------------------------------------------------------       *
*   Feeder # 1    9.5 Mix %     3.4 Moist %    A.C.      On  Time  245 Sec             *
*   Feeder # 2    0.0 Mix %     2.5 Moist %    A.C.      Off Time  200 Sec             *
*   Feeder # 3    6.6 Mix %    15.7 Moist %                                            *
*   Feeder # 4    0.0 Mix %    13.7 Moist %                                            *
*   Feeder # 5    0.0 Mix %     2.7 Moist %                                            *
*   Feeder # 6   36.0 Mix %     2.6 Moist %    Mix Temp Set        320 Deg             *
*   Feeder # 7   28.4 Mix %     4.9 Moist %                                            *
*                                                                                      *
*   R.A.P.       14.2 Mix %     7.5 Moist %      4.0 A.C. %                            *
*                                                                                      *
*   A.C.          5.3 Mix %                                                            *
*                                                                                      *
*                                                                                      *
*               ------                                                                 *
*      Total    100.0 %                        Additive    0.00 Mix %                  *
*                                                                                      *
*                                                                                      *
****************************************************************************************
```

```
****************************************************************************************
*                                                                                      *
*                                    Lehman - Roberts                                  *
*          09-30-91                                                 14:50:06           *
*                                  Plant Status Report                                 *
*                                                                                      *
****************************************************************************************
*                     Rate   Units                        Total     Units              *
* ----------------------------------------------------------------------------         *
* Production          298   Tons Per Hour                  1893      Tons              *
* Aggregate           241   Tons Per Hour                  1458.4    Tons              *
* Total   A.C.        15.7  Tons Per Hour                                              *
* Virgin A.C.         14.1  Tons Per Hour                  85.30     Tons              *
*                                                                                      *
* R.A.P.   A.C.        1.6  Tons Per Hour                                              *
*                                                                                      *
* R.A.P.               41   Tons Per Hour                  350.7     Tons              *
*                                                                                      *
*                                                                                      *
* Additive              0   Lbs  Per Hour                                              *
*                                                 Agg. Composite Moisture    4.6 %     *
*                                                                                      *
*    Mix    Temperature    330 Deg.               Sling.  Position    70 %             *
*    A.C.   Temperature    320 Deg.               Burner Position     34 %             *
*                                                 Damper Position     57 %             *
*  Stack    Temperature    259 Deg.                                                     *
*                                                 B/H Pulse Time      20     Seconds    *
*    Instant Actual A.C.    5.26 %                Negative  Press     0.23 Inches       *
*    Average Actual A.C.    5.29 %                B/H Diff. Press     3.2  Inches       *
```

```
*                Running Mix # 51                                           *
*                        Name : 411-E                                       *
*                Description : 411-E/W RAP AC IN RAP 3.5%                   *
*           ----------------------------------------------------------      *
*  Feeder # 1    9.5 Mix %     3.4 Moist %   A.C.     On   Time  245 Sec   *
*  Feeder # 2    0.0 Mix %     2.5 Moist %   A.C.     Off  Time  200 Sec   *
*  Feeder # 3    6.6 Mix %    15.7 Moist %                                 *
*  Feeder # 4    0.0 Mix %    13.7 Moist %                                 *
*  Feeder # 5    0.0 Mix %     2.7 Moist %                                 *
*  Feeder # 6   36.0 Mix %     2.6 Moist %   Mix Temp Set       320 Deg    *
*  Feeder # 7   28.4 Mix %     4.9 Moist %                                 *
*                                                                          *
*  R.A.P.       14.2 Mix %     7.5 Moist %     4.0 A.C. %                  *
*                                                                          *
*  A.C.          5.3 Mix %                                                 *
*                                                                          *
*                                                                          *
*              ------                                                      *
*     Total    100.0 %                      Additive    0.00 Mix %         *
*                                                                          *
*                                                                          *
****************************************************************************


      09-30-91   14:53:47   Feeder MAX TPH Calibration Error


****************************************************************************
*                                                                          *
*                            Lehman - Roberts                              *
*          09-30-91                                          14:59:28      *
*                          Plant Status Report                             *
*                                                                          *
****************************************************************************
*                 Rate   Units                  Total    Units             *
* ---------------------------------------------------------------          *
* Production       297   Tons Per Hour          1942     Tons              *
* Aggregate        238   Tons Per Hour          1496.3   Tons              *
* Total  A.C.     16.1   Tons Per Hour                                     *
* Virgin A.C.     14.3   Tons Per Hour          87.53    Tons              *
*                                                                          *
* R.A.P.  A.C.     1.7   Tons Per Hour                                     *
*                                                                          *
* R.A.P.            43   Tons Per Hour          359.7    Tons              *
*                                                                          *
*                                                                          *
* Additive           0   Lbs  Per Hour                                     *
*                                      Agg. Composite Moisture    4.6 %    *
*                                                                          *
*  Mix   Temperature   329 Deg.        Sling. Position     70 %            *
*  A.C.  Temperature   320 Deg.        Burner Position     35 %            *
*                                      Damper Position     57 %            *
*  Stack Temperature   265 Deg.                                            *
*                                      B/H Pulse Time      20    Seconds   *
*  Instant Actual A.C.   5.38 %        Negative  Press    0.22   Inches    *
*  Average Actual A.C.   5.28 %        B/H Diff. Press     3.2   Inches    *
****************************************************************************
```

```
*                    Name : 411-E
*             Description : 411-E/W RAP AC IN RAP 3.5%
*        ------------------------------------------------------------------
*    Feeder # 1    9.5 Mix %     3.4 Moist %   A.C.     On  Time  245 Sec   *
*    Feeder # 2    0.0 Mix %     2.5 Moist %   A.C.     Off Time  200 Sec   *
*    Feeder # 3    6.6 Mix %    15.7 Moist %                                *
*    Feeder # 4    0.0 Mix %    13.7 Moist %                                *
*    Feeder # 5    0.0 Mix %     2.7 Moist %                                *
*    Feeder # 6   36.0 Mix %     2.6 Moist %   Mix Temp Set      320 Deg    *
*    Feeder # 7   28.4 Mix %     4.9 Moist %                                *
*                                                                           *
*    R.A.P.       14.2 Mix %     7.5 Moist %      4.0 A.C. %                *
*                                                                           *
*    A.C.          5.3 Mix %                                                *
*                                                                           *
*                                                                           *
*                 ------                                                    *
*       Total    100.0 %                      Additive   0.00 Mix %         *
*                                                                           *
*                                                                           *
*****************************************************************************
```

Formaldehyde

RUN 3

```
************************************************************************
*                                                                      *
*                        Lehman - Roberts                              *
*          09-30-91                                        16:04:58    *
*                     Plant Status Report                              *
*                                                                      *
************************************************************************
*                  Rate   Units                 Total    Units         *
*  -------------------------------------------------------------       *
* Production       299    Tons Per Hour        2016      Tons          *
* Aggregate        243    Tons Per Hour        1553.8    Tons          *
* Total  A.C.       15.8  Tons Per Hour                                *
* Virgin A.C.       14.3  Tons Per Hour          90.90   Tons          *
*                                                                      *
* R.A.P.  A.C.       1.6  Tons Per Hour                                *
*                                                                      *
* R.A.P.            40    Tons Per Hour         371.2    Tons          *
*                                                                      *
*                                                                      *
* Additive           0    Lbs  Per Hour                                *
*                                        Agg. Composite Moisture  4.6 % *
*                                                                      *
*   Mix      Temperature    320 Deg.     Sling. Position     70 %      *
*   A.C.     Temperature    321 Deg.     Burner Position     44 %      *
*                                        Damper Position     55 %      *
*   Stack    Temperature    251 Deg.                                   *
*                                        B/H Pulse Time      20   Seconds *
*   Instant Actual A.C.     5.33 %       Negative  Press    0.16 Inches *
*   Average Actual A.C.     5.32 %       B/H Diff. Press    2.8  Inches *
************************************************************************
*                                                                      *
*          Running Mix # 51                                            *
*                 Name : 411-E                                         *
*          Description : 411-E/W RAP AC IN RAP 3.5%                    *
*          ---------------------------------------------------------   *
*    Feeder # 1    9.5 Mix %    3.4 Moist %   A.C.    On  Time  245 Sec *
*    Feeder # 2    0.0 Mix %    2.5 Moist %   A.C.    Off Time  200 Sec *
*    Feeder # 3    6.6 Mix %   15.7 Moist %                            *
*    Feeder # 4    0.0 Mix %   13.7 Moist %                            *
*    Feeder # 5    0.0 Mix %    2.7 Moist %                            *
*    Feeder # 6   36.0 Mix %    2.6 Moist %  Mix Temp Set     320 Deg  *
*    Feeder # 7   28.4 Mix %    4.9 Moist %                            *
*                                                                      *
*    R.A.P.       14.2 Mix %    7.5 Moist %     4.0 A.C. %             *
*                                                                      *
*    A.C.          5.3 Mix %                                           *
*                                                                      *
*                                                                      *
*                 ------                                               *
*       Total    100.0 %                    Additive  0.00 Mix %       *
*                                                                      *
*                                                                      *
************************************************************************
```

09-30-91 16:09:52 Feeder MAX TPH Calibration Error

```
**********************************************************************
*                                                                    *
*                        Lehman - Roberts                            *
*     09-30-91                                       16:14:06        *
*                      Plant Status Report                           *
*                                                                    *
**********************************************************************
*              Rate   Units                    Total    Units        *
*  ------------------------------------------------------------      *
* Production    305   Tons Per Hour            2063     Tons         *
* Aggregate     250   Tons Per Hour            1590.6   Tons         *
* Total  A.C.   16.0  Tons Per Hour                                  *
* Virgin A.C.   14.4  Tons Per Hour            93.06 Tons            *
*                                                                    *
* R.A.P.  A.C.   1.6  Tons Per Hour                                  *
*                                                                    *
* R.A.P.         39   Tons Per Hour            379.5  Tons           *
*                                                                    *
*                                                                    *
* Additive        0   Lbs  Per Hour                                  *
*                                    Agg. Composite Moisture   4.6 % *
*                                                                    *
*  Mix    Temperature    324 Deg.    Sling. Position    70 %         *
*  A.C.   Temperature    321 Deg.    Burner Position    37 %         *
*                                    Damper Position    55 %         *
*  Stack  Temperature    248 Deg.                                    *
*                                    B/H Pulse Time     20   Seconds *
*  Instant Actual A.C.   5.22 %      Negative  Press    0.18 Inches  *
*  Average Actual A.C.   5.30 %      B/H Diff. Press    2.8  Inches  *
**********************************************************************
*                                                                    *
*        Running Mix # 51                                            *
*               Name : 411-E                                         *
*        Description : 411-E/W RAP AC IN RAP 3.5%                    *
*        ------------------------------------------------------      *
*  Feeder # 1   9.5 Mix %    3.4 Moist %   A.C.   On  Time  245 Sec  *
*  Feeder # 2   0.0 Mix %    2.5 Moist %   A.C.   Off Time  200 Sec  *
*  Feeder # 3   6.6 Mix %   15.7 Moist %                             *
*  Feeder # 4   0.0 Mix %   13.7 Moist %                             *
*  Feeder # 5   0.0 Mix %    2.7 Moist %                             *
*  Feeder # 6  36.0 Mix %    2.6 Moist %   Mix Temp Set     320 Deg  *
*  Feeder # 7  28.4 Mix %    4.9 Moist %                             *
*                                                                    *
*  R.A.P.      14.2 Mix %    7.5 Moist %    4.0 A.C. %               *
*                                                                    *
*  A.C.         5.3 Mix %                                            *
*                                                                    *
*                                                                    *
*            ------                                                  *
*    Total    100.0 %                     Additive  0.00 Mix %       *
*                                                                    *
*                                                                    *
**********************************************************************
```

09-30-91 16:22:19 Feeder MAX TPH Calibration Error

```
***********************************************************************
*                                                                     *
*                        Lehman - Roberts                             *
*        09-30-91                                      16:24:06      *
*                      Plant Status Report                            *
*                                                                     *
***********************************************************************
*               Rate   Units                  Total   Units           *
*  ----------------------------------------------------------        *
* Production     290   Tons Per Hour          2115    Tons            *
* Aggregate      234   Tons Per Hour          1631.2  Tons            *
* Total  A.C.     15.4 Tons Per Hour                                  *
* Virgin A.C.     13.8 Tons Per Hour          95.44 Tons              *
*                                                                     *
* R.A.P.  A.C.     1.6 Tons Per Hour                                  *
*                                                                     *
* R.A.P.         41    Tons Per Hour           388.7  Tons            *
*                                                                     *
*                                                                     *
* Additive        0    Lbs  Per Hour                                  *
*                                   Agg. Composite Moisture    4.6 %  *
*                                                                     *
*   Mix    Temperature   331 Deg.   Sling. Position   70 %            *
*   A.C.   Temperature   321 Deg.   Burner Position   35 %            *
*                                   Damper Position   55 %            *
*   Stack  Temperature   258 Deg.                                     *
*                                   B/H Pulse Time    20    Seconds   *
*   Instant Actual A.C.  5.31 %     Negative  Press   0.19 Inches     *
*   Average Actual A.C.  5.30 %     B/H Diff. Press   2.9   Inches    *
***********************************************************************
*                                                                     *
*        Running Mix # 51                                             *
*               Name : 411-E                                          *
*        Description : 411-E/W RAP AC IN RAP 3.5%                     *
*        -------------------------------------------------------      *
*  Feeder # 1   9.5 Mix %    3.4 Moist % A.C.   On  Time  245 Sec     *
*  Feeder # 2   0.0 Mix %    2.5 Moist % A.C.   Off Time  200 Sec     *
*  Feeder # 3   6.6 Mix %   15.7 Moist %                              *
*  Feeder # 4   0.0 Mix %   13.7 Moist %                              *
*  Feeder # 5   0.0 Mix %    2.7 Moist %                              *
*  Feeder # 6  36.0 Mix %    2.6 Moist %   Mix Temp Set   320 Deg     *
*  Feeder # 7  28.4 Mix %    4.9 Moist %                              *
*                                                                     *
*  R.A.P.      14.2 Mix %    7.5 Moist %   4.0 A.C. %                 *
*                                                                     *
*  A.C.         5.3 Mix %                                             *
*                                                                     *
*                                                                     *
*             -------                                                 *
*     Total   100.0 %                  Additive  0.00 Mix %           *
*                                                                     *
*                                                                     *
***********************************************************************
```

Lehman - Roberts

09-30-91 16:34:07

Plant Status Report

	Rate	Units	Total	Units
Production	285	Tons Per Hour	2167	Tons
Aggregate	228	Tons Per Hour	1671.4	Tons
Total A.C.	15.5	Tons Per Hour		
Virgin A.C.	13.9	Tons Per Hour	97.81	Tons
R.A.P. A.C.	1.6	Tons Per Hour		
R.A.P.	41	Tons Per Hour	398.2	Tons
Additive	0	Lbs Per Hour		

Agg. Composite Moisture 4.6 %

Mix Temperature	337 Deg.	
A.C. Temperature	321 Deg.	
Stack Temperature	262 Deg.	
Instant Actual A.C.	5.45 %	
Average Actual A.C.	5.29 %	

Sling. Position	70 %	
Burner Position	33 %	
Damper Position	55 %	
B/H Pulse Time	20	Seconds
Negative Press	0.21	Inches
B/H Diff. Press	3.0	Inches

Running Mix # 51

Name : 411-E

Description : 411-E/W RAP AC IN RAP 3.5%

Feeder # 1	9.5 Mix %	3.4 Moist %	A.C. On Time 245 Sec
Feeder # 2	0.0 Mix %	2.5 Moist %	A.C. Off Time 200 Sec
Feeder # 3	6.6 Mix %	15.7 Moist %	
Feeder # 4	0.0 Mix %	13.7 Moist %	
Feeder # 5	0.0 Mix %	2.7 Moist %	
Feeder # 6	36.0 Mix %	2.6 Moist %	Mix Temp Set 320 Deg
Feeder # 7	28.4 Mix %	4.9 Moist %	
R.A.P.	14.2 Mix %	7.5 Moist %	4.0 A.C. %
A.C.	5.3 Mix %		
Total	100.0 %		Additive 0.00 Mix %

09-30-91 16:39:10 Bin #5 High

```
*****************************************************************************
*                                                                           *
*                           Lehman - Roberts                                *
*        09-30-91                                              16:44:06     *
*                         Plant Status Report                               *
*                                                                           *
*****************************************************************************
*                    Rate   Units              Total   Units                *
*   ---------------------------------------------------------               *
* Production         295   Tons Per Hour        2220   Tons                 *
* Aggregate          237   Tons Per Hour      1712.2   Tons                 *
* Total  A.C.       15.9  Tons Per Hour                                     *
* Virgin A.C.       14.2  Tons Per Hour       100.19  Tons                  *
*                                                                           *
* R.A.P.  A.C.       1.7  Tons Per Hour                                     *
*                                                                           *
* R.A.P.             42    Tons Per Hour       407.6   Tons                 *
*                                                                           *
*                                                                           *
* Additive            0    Lbs  Per Hour                                    *
*                                       Agg. Composite Moisture     4.6 %   *
*                                                                           *
*   Mix    Temperature    329 Deg.     Sling. Position     70 %             *
*   A.C.   Temperature    321 Deg.     Burner Position     35 %             *
*                                      Damper Position     55 %             *
*   Stack  Temperature    260 Deg.                                          *
*                                      B/H Pulse Time      20    Seconds    *
*   Instant Actual A.C.    5.38 %      Negative  Press     0.17 Inches      *
*   Average Actual A.C.    5.29 %      B/H Diff. Press     3.0  Inches      *
*****************************************************************************
*                                                                           *
*           Running Mix # 51                                                *
*                  Name : 411-E                                             *
*           Description : 411-E/W RAP AC IN RAP 3.5%                        *
*                                                                           *
*  Feeder # 1    9.5 Mix %     3.4 Moist %   A.C.    On   Time   245 Sec    *
*  Feeder # 2    0.0 Mix %     2.5 Moist %   A.C.    Off  Time   200 Sec    *
*  Feeder # 3    6.6 Mix %    15.7 Moist %                                  *
*  Feeder # 4    0.0 Mix %    13.7 Moist %                                  *
*  Feeder # 5    0.0 Mix %     2.7 Moist %                                  *
*  Feeder # 6   36.0 Mix %     2.6 Moist %   Mix Temp Set        320 Deg    *
*  Feeder # 7   28.4 Mix %     4.9 Moist %                                  *
*                                                                           *
*  R.A.P.       14.2 Mix %     7.5 Moist %     4.0 A.C. %                   *
*                                                                           *
*  A.C.          5.3 Mix %                                                  *
*                                                                           *
*                                                                           *
*             ------                                                        *
*    Total    100.0 %                   Additive    0.00 Mix %              *
*                                                                           *
*                                                                           *
*****************************************************************************

      09-30-91   16:49:31   Recycle Deviation
```

```
**************************************************************************
*                                                                        *
*                          Lehman - Roberts                              *
*          09-30-91                                         16:54:06     *
*                        Plant Status Report                             *
*                                                                        *
**************************************************************************
*                  Rate   Units                 Total    Units           *
*  --------------------------------------------------------------        *
* Production       295   Tons Per Hour         2271      Tons            *
* Aggregate        238   Tons Per Hour         1752.1    Tons            *
* Total  A.C.      15.7  Tons Per Hour                                   *
* Virgin A.C.      14.1  Tons Per Hour         102.55    Tons            *
*                                                                        *
* R.A.P.  A.C.     1.6   Tons Per Hour                                   *
*                                                                        *
* R.A.P.           41    Tons Per Hour         416.9     Tons            *
*                                                                        *
*                                                                        *
* Additive         0     Lbs  Per Hour                                   *
*                                      Agg. Composite Moisture   4.6 %   *
*                                                                        *
*   Mix   Temperature   323 Deg.       Sling. Position      70 %         *
*   A.C.  Temperature   321 Deg.       Burner Position      39 %         *
*                                      Damper Position      55 %         *
*   Stack Temperature   247 Deg.                                         *
*                                      B/H Pulse Time       20   Seconds *
*   Instant Actual A.C.   5.32 %       Negative Press     0.12   Inches  *
*   Average Actual A.C.   5.28 %       B/H Diff. Press    2.8    Inches  *
**************************************************************************
*                                                                        *
*            Running Mix # 51                                            *
*                  Name : 411-E                                          *
*            Description : 411-E/W RAP AC IN RAP 3.5%                    *
*            ---------------------------------------------------------   *
*  Feeder # 1   9.5 Mix %     3.4 Moist %   A.C.    On  Time  245 Sec    *
*  Feeder # 2   0.0 Mix %     2.5 Moist %   A.C.    Off Time  200 Sec    *
*  Feeder # 3   6.6 Mix %    15.7 Moist %                                *
*  Feeder # 4   0.0 Mix %    13.7 Moist %                                *
*  Feeder # 5   0.0 Mix %     2.7 Moist %                                *
*  Feeder # 6  36.0 Mix %     2.6 Moist %   Mix Temp Set      320 Deg    *
*  Feeder # 7  28.4 Mix %     4.9 Moist %                                *
*                                                                        *
*  R.A.P.      14.2 Mix %     7.5 Moist %    4.0 A.C. %                  *
*                                                                        *
*  A.C.         5.3 Mix %                                                *
*                                                                        *
*                                                                        *
*              ------                                                    *
*    Total    100.0 %                       Additive  0.00 Mix %         *
*                                                                        *
*                                                                        *
**************************************************************************

**************************************************************************
*                                                                        *
*                          Lehman - Roberts                              *
```

```
*                                                                          *
****************************************************************************
*                    Rate   Units                   Total    Units          *
*  ----------------------------------------------------------------         *
*  Production       288    Tons Per Hour          2323     Tons             *
*  Aggregate        233    Tons Per Hour          1792.5   Tons             *
*  Total   A.C.       15.3 Tons Per Hour                                    *
*  Virgin A.C.        13.7 Tons Per Hour           104.91  Tons             *
*                                                                           *
*  R.A.P.   A.C.       1.6 Tons Per Hour                                    *
*                                                                           *
*  R.A.P.             40   Tons Per Hour           426.3   Tons             *
*                                                                           *
*                                                                           *
*  Additive            0   Lbs   Per Hour                                   *
*                                              Agg. Composite Moisture   4.6 % *
*                                                                           *
*    Mix      Temperature    340 Deg.          Sling. Position    70 %      *
*    A.C.     Temperature    322 Deg.          Burner Position    32 %      *
*                                              Damper Position    55 %      *
*    Stack    Temperature    266 Deg.                                       *
*                                              B/H Pulse Time     20    Seconds *
*    Instant Actual A.C.     5.33 %            Negative  Press    0.18 Inches *
*    Average Actual A.C.     5.29 %            B/H Diff. Press    3.0  Inches *
****************************************************************************
*                                                                           *
*              Running Mix # 51                                             *
*                     Name : 411-E                                          *
*              Description : 411-E/W RAP AC IN RAP 3.5%                     *
*              ---------------------------------------------------          *
*   Feeder # 1    9.5 Mix %     3.4 Moist %   A.C.    On  Time  245 Sec     *
*   Feeder # 2    0.0 Mix %     2.5 Moist %   A.C.    Off Time  200 Sec     *
*   Feeder # 3    6.6 Mix %    15.7 Moist %                                 *
*   Feeder # 4    0.0 Mix %    13.7 Moist %                                 *
*   Feeder # 5    0.0 Mix %     2.7 Moist %                                 *
*   Feeder # 6   36.0 Mix %     2.6 Moist %   Mix Temp Set       320 Deg    *
*   Feeder # 7   28.4 Mix %     4.9 Moist %                                 *
*                                                                           *
*   R.A.P.       14.2 Mix %     7.5 Moist %     4.0 A.C.  %                 *
*                                                                           *
*   A.C.          5.3 Mix %                                                 *
*                                                                           *
*                                                                           *
*                ------                                                     *
*      Total    100.0 %                        Additive   0.00 Mix %        *
*                                                                           *
*                                                                           *
****************************************************************************




        09-30-91   17:13:42  Bin #4 High




****************************************************************************
*                                                                           *
*                                  Lehman - Roberts                         *
*         09-30-91                                               17:14:06   *
```

	Rate	Units	Total	Units
Production	291	Tons Per Hour	2375	Tons
Aggregate	237	Tons Per Hour	1832.3	Tons
Total A.C.	15.4	Tons Per Hour		
Virgin A.C.	13.8	Tons Per Hour	107.25	Tons
R.A.P. A.C.	1.6	Tons Per Hour		
R.A.P.	39	Tons Per Hour	435.5	Tons
Additive	0	Lbs Per Hour		

Agg. Composite Moisture 4.6 %

Mix Temperature	325 Deg.	Sling. Position	70 %
A.C. Temperature	322 Deg.	Burner Position	35 %
		Damper Position	55 %
Stack Temperature	249 Deg.		
		B/H Pulse Time	20 Seconds
Instant Actual A.C.	5.29 %	Negative Press	0.16 Inches
Average Actual A.C.	5.29 %	B/H Diff. Press	2.8 Inches

Running Mix # 51
Name : 411-E
Description : 411-E/W RAP AC IN RAP 3.5%

Feeder # 1	9.5 Mix %	3.4 Moist %	A.C. On Time	245 Sec
Feeder # 2	0.0 Mix %	2.5 Moist %	A.C. Off Time	200 Sec
Feeder # 3	6.6 Mix %	15.7 Moist %		
Feeder # 4	0.0 Mix %	13.7 Moist %		
Feeder # 5	0.0 Mix %	2.7 Moist %		
Feeder # 6	36.0 Mix %	2.6 Moist %	Mix Temp Set	320 Deg
Feeder # 7	28.4 Mix %	4.9 Moist %		
R.A.P.	14.2 Mix %	7.5 Moist %	4.0 A.C. %	
A.C.	5.3 Mix %			
Total	100.0 %		Additive	0.00 Mix %

09-30-91 17:23:14 Bin #5 High

Lehman - Roberts

09-30-91 17:24:07

Plant Status Report

```
*               Rate   Units                  Total    Units                     *
*---------------------------------------------------------------                 *
* Production      308   Tons Per Hour        2426     Tons                        *
* Aggregate       248   Tons Per Hour       1872.4    Tons                        *
* Total  A.C.     16.0  Tons Per Hour                                             *
* Virgin A.C.     14.3  Tons Per Hour        109.61   Tons                        *
*                                                                                 *
* R.A.P.  A.C.     1.7  Tons Per Hour                                             *
*                                                                                 *
* R.A.P.           42   Tons Per Hour        445.0    Tons                        *
*                                                                                 *
*                                                                                 *
* Additive          0   Lbs  Per Hour                                             *
*                                          Agg. Composite Moisture    4.6 %      *
*                                                                                 *
*   Mix    Temperature    314 Deg.         Sling. Position     70 %               *
*   A.C.   Temperature    322 Deg.         Burner Position     43 %               *
*                                          Damper Position     55 %               *
*   Stack  Temperature    247 Deg.                                                *
*                                          B/H Pulse Time      20    Seconds     *
*   Instant Actual A.C.   5.22 %           Negative  Press     0.15  Inches      *
*   Average Actual A.C.   5.28 %           B/H Diff. Press     2.7   Inches      *
*********************************************************************************
*                                                                                 *
*                Running Mix # 51                                                 *
*                       Name : 411-E                                              *
*                Description : 411-E/W RAP AC IN RAP 3.5%                         *
*                ----------------------------------------------------------       *
*   Feeder # 1    9.5 Mix %     3.4 Moist %   A.C.     On  Time   245 Sec        *
*   Feeder # 2    0.0 Mix %     2.5 Moist %   A.C.     Off Time   200 Sec        *
*   Feeder # 3    6.6 Mix %    15.7 Moist %                                       *
*   Feeder # 4    0.0 Mix %    13.7 Moist %                                       *
*   Feeder # 5    0.0 Mix %     2.7 Moist %                                       *
*   Feeder # 6   36.0 Mix %     2.6 Moist %   Mix Temp Set        320 Deg        *
*   Feeder # 7   28.4 Mix %     4.9 Moist %                                       *
*                                                                                 *
*   R.A.P.       14.2 Mix %     7.5 Moist %     4.0 A.C. %                        *
*                                                                                 *
*   A.C.          5.3 Mix %                                                       *
*                                                                                 *
*                                                                                 *
*                ------                                                           *
*      Total     100.0 %                       Additive   0.00 Mix %              *
*                                                                                 *
*                                                                                 *
*********************************************************************************



*********************************************************************************
*                                                                                 *
*                              Lehman - Roberts                                   *
*          09-30-91                                            17:29:05           *
*                             Plant Status Report                                 *
*                                                                                 *
*********************************************************************************
*               Rate   Units                  Total    Units                     *
*---------------------------------------------------------------                 *
* Production      297   Tons Per Hour        2452     Tons                        *
* Aggregate       240   Tons Per Hour       1892.1    Tons                        *
* Total  A.C.     15.7  Tons Per Hour                                             *
```

R.A.P. A.C. 1.6 Tons Per Hour

R.A.P. 41 Tons Per Hour 449.9 Tons

Additive 0 Lbs Per Hour

App. Composite [illegible] 4.[illegible] %

Mix	Temperature	335 Deg.	Sling. Position	70 %	
A.C.	Temperature	322 Deg.	Burner Position	27 %	
			Damper Position	25 %	
Stack	Temperature	248 Deg.			
			B/H Pulse Time	20	Seconds
Instant Actual A.C.		5.28 %	Negative Press	0.15	Inches
Average Actual A.C.		5.1[illegible] %	B/H Diff. Press	2.[illegible]	Inches

Running Mix # 21

Name : 411-E

Description : 411-E/W RAP 20 in RAP 5.5[illegible]

Feeder # 1	9.5 Mix %	3.4 Moist %	A.C.	On Time 245 Sec
Feeder # 2	0.0 Mix %	2.2 Moist %	A.C.	Off Time 200 Sec
Feeder # 3	5.6 Mix %	15.7 Moist %		
Feeder # 4	0.0 Mix %	11.7 Moist %		
Feeder # 5	0.0 Mix %	2.7 Moist %		
Feeder # 6	26.3 Mix %	1.6 Moist %	Mix Temp Set	310 Deg
Feeder # 7	28.4 Mix %	4.3 Moist %		
R.A.P.	14.2 Mix %	7.5 Moist %	4.[illegible] A.C. %	
A.C.	5.2 Mix %			

Total 100.2 % [illegible]

V. EQUIPMENT USED

Equipment used on conducting the particulate emissions test was:

A. The Lear Siegler PM-100 stack sampler with appropriate auxillary equipment and glassware. The train was set up according to the schematic on the nex page.

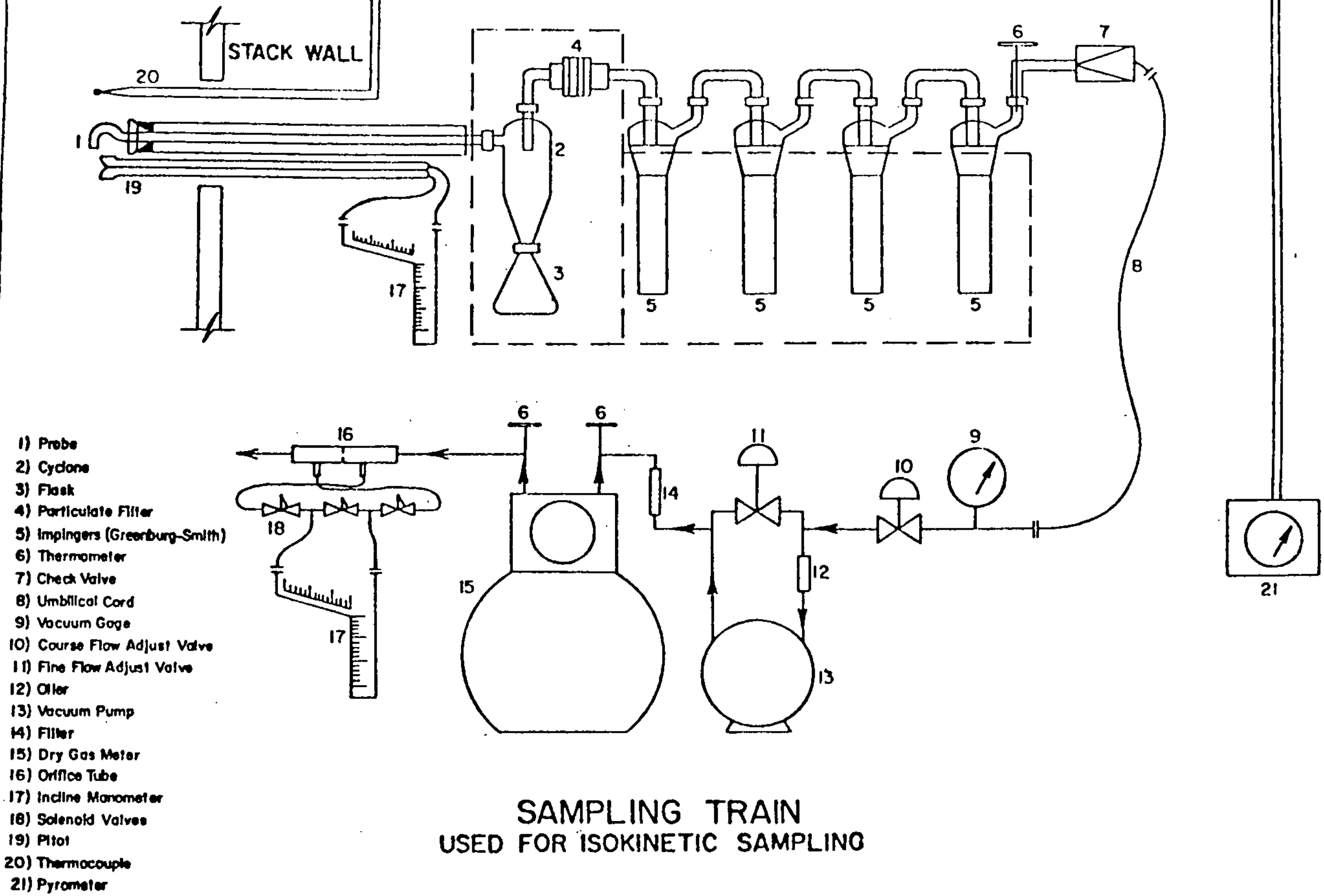
B. An Airguide Instruments Model 211-B (uncorrected) aneroid barometer was used to check the barometric pressure.

C. Weston dial thermometers are used to check meter temperatures. An Analogic Model 2572 Digital Thermocouple is used for stack temperatures.

D. A Hays 621 Analyzer was used to measure the oxygen, carbon dioxide and carbon monoxide content of the stack gases. For non-combustion sources, A Bacharach Instrument Company Fyrite is used for the gas analysis.

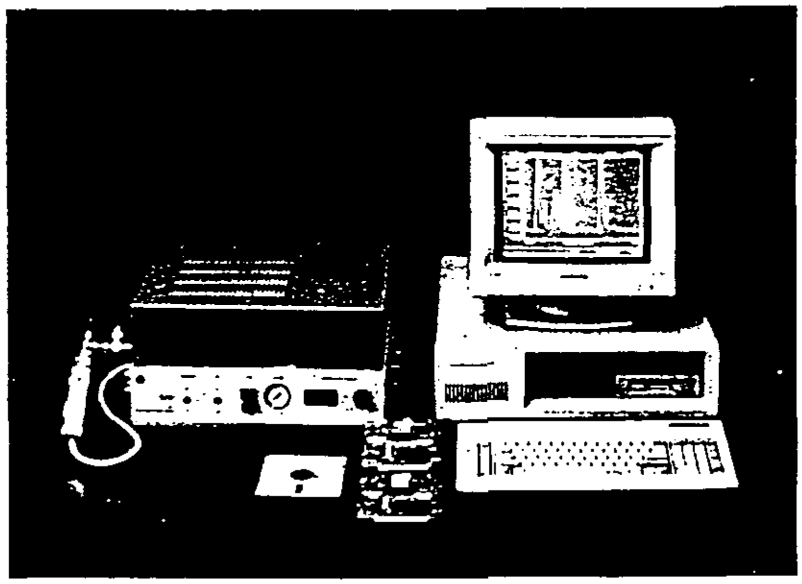
E. Filters are mady by Schleicher and Schuell and are type 1-HV with a porosity of .03 microns.

F. The acetone is reagent grade or ACS grade with a residue of $\leq$ .001.



SAMPLING TRAIN
USED FOR ISOKINETIC SAMPLING

8610 Gas Chromatograph

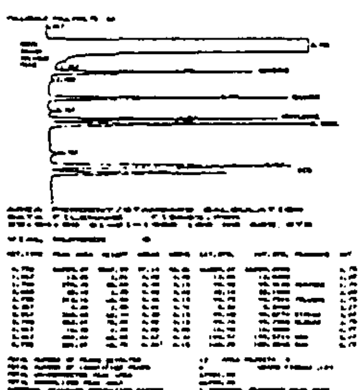


Low Cost GC • Free Data System/Integrator
Field Portable • Built-In Purge and Trap
Temperature Programmable • Multiple Detectors

Miniature Lab GC
At a fraction of the cost, the SRI 8610 Gas Chromatograph provides the capabilities and sophistication of vastly larger and more expensive instruments in a small, lightweight and attractive package. More of a miniaturized laboratory GC than a true portable, the 8610 is the perfect size and weight for easy field use without sacrificing big GC features. In the lab or in the field, the 8610 Gas Chromatograph gives you up to five detectors plus a built-in purge and trap in a simple to operate, easy to trouble-shoot, and unbelievably low cost package. And, the Peaksimple Data System, provided free with every 8610 GC turns your IBM PC into a powerful chromatography integrator which also controls the 8610's temperature program and purge and trap.

Multi-Level Temperature Programming
Temperature programming is a standard feature on every 8610 GC. Up to 15 ramp/-plateau segments permit maximum flexibility. Because the temperature program is controlled by the data system, an unlimited number of different temperature programs may be permanently stored on disk and activated with a few keystrokes. The 8610's temperature program can be controlled either by the Peaksimple Data System (included free with every GC) or by any other data system or integrator which has the ability to close relay contacts at specified times during the run.

Ultra Low Mass Column Oven
The SRI 8610's large easily accessible column oven is designed to fit all standard packed and capillary columns with diameters up to eight inches. The ultra-low mass design allows rapid heat-up and cool-down from ambient to 250 degrees centigrade. Interchangeable screw-in heater elements allow power consumption to be reduced for low temperature battery powered applications, or easy heater replacement in the event of a failure. Squirrel-cage type oven fan insures uniform heat distribution and stability to within .1 degree.



100 NG. 602 STD. Data plotted using Peaksimple Data System.

Digital Gas Flow Controllers
The carrier gas flow rate is regulated by a unique Digital Flow Controller. Precise and reproducible even at capillary flow rates below 1 cc/per minute., the carrier gas flow controller is standard equipment on every SRI 8610 GC (except low-cost student model). Digital dial allows flow rates to be adjusted without having to measure actual flows with a bubblemeter. A column head pressure gauge is provided to alert the operator to leaks or blockages in the column. The same flow controller is optionally available for hydrogen and air combustion gas flows (recommended for NPD operation). In addition, inlet pressure regulators are supplied for each gas to isolate the GC from fluctuations in gas supply pressure.

Direct Cool On Column Injection
The zero-dead volume on-column injector is designed for state of the art, cool on-column injections using both packed and wide-bore capillary (.53mm.). A special wide-bore adapter positions the .53mm column so the syringe smoothly deposits the sample in the bore of the column itself. This provides a totally inert, metal and glass free sample path. Peaks are exceptionally sharp and well resolved.

Detectors

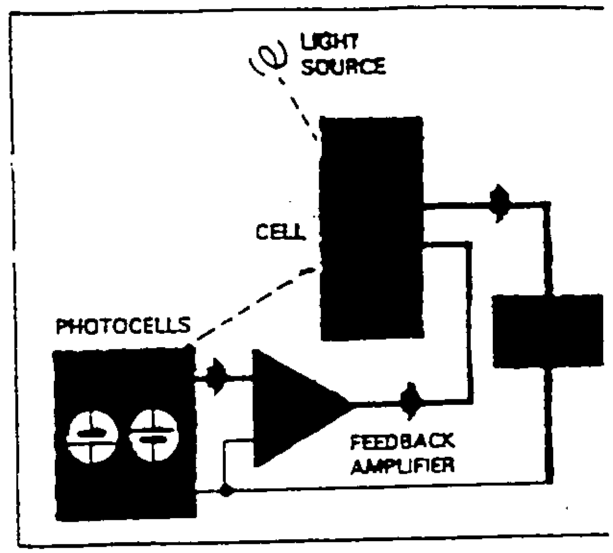
Thermal Conductivity (TCD)	Photo-Ionization (PID)
Flame Ionization (FID)	Electron Capture (ECD)
Nitrogen-Phosphorus (NPD)	Hall Detector (HALL or ELCD)
Thermionic Ionization (TID)	Flame Photometric (FPD)

Up to 3 detectors may be mounted simultaneously and plumbed in series so that one injection passes through each detector and into the next. Common series configurations include: (PID-FID), (TCD-FID), (PID-ECD), (PID-HALL) and (PID-ECD-FID).

PRINCIPLES OF OPERATION

Servomex 1400 Series Gas Analyzers

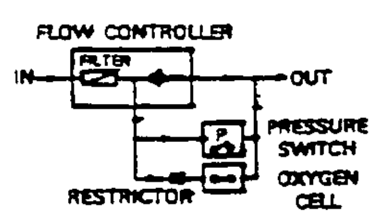
SPECIFICATION	OXYGEN
Principle	Magneto-dynamic
Linearity	±0.2% O_2
Repeatability	±0.2% O_2
Zero Drift (Per Week)	<0.2% O_2
Signal Output	0-1V non-isolated for 0-100% O_2
Alarms	Flow alarm. 4 sets of changeover relay contacts rated at 3A/120V AC, 1A/240V AC or 1A/28V DC
Display	3½ digit LCD reading 0 to 100% O_2
Response Time	Less than 15 seconds to 90%
Operating Ambient Temperature	32 - 104°F (0 - 40°C)
Relative Humidity	0 - 85%, non-condensing
Sample Pressure	0.2 to 0.6 barg
Flowrate	1.5 to 6 liters/min
Sample Condition	Clean, dry, non-toxic, non-flammable gas
Sample Contact Materials	Stainless steel, pyrex glass, brass, platinum, epoxy resin, viton, polypropylene and glass fibre
AC Supply	110 to 120V AC, or 220 to 240V AC, ±10%, 48 to 62Hz, 15VA maximum
Dimensions	19" Rack - 4U case Bench top - 7.1" (180mm) high, 10.1" (256mm) wide, 15.4" (390mm) deep
	22 lbs (10kg) approximately



PARAMAGNETIC OXYGEN

The oxygen analyzer measures the paramagnetic susceptibility of the sample gas by means of a magneto-dynamic type measuring cell.

Oxygen is virtually unique in being a paramagnetic gas, this means that it is attracted into a magnetic field. In the Servomex measuring cell, the oxygen concentration is detected by means of a dumb-bell mounted on a torque suspension in a strong, non-linear magnetic field. The higher the concentration of oxygen, the greater the dumb-bell is deflected from its rest position. This deflection is detected by an optical system and twin photocells connected to an amplifier. Around the dumb-bell is a coil of wire. A current is passed through this coil to return the dumb-bell to its original position. The current is measured and is proportional to the oxygen concentration.



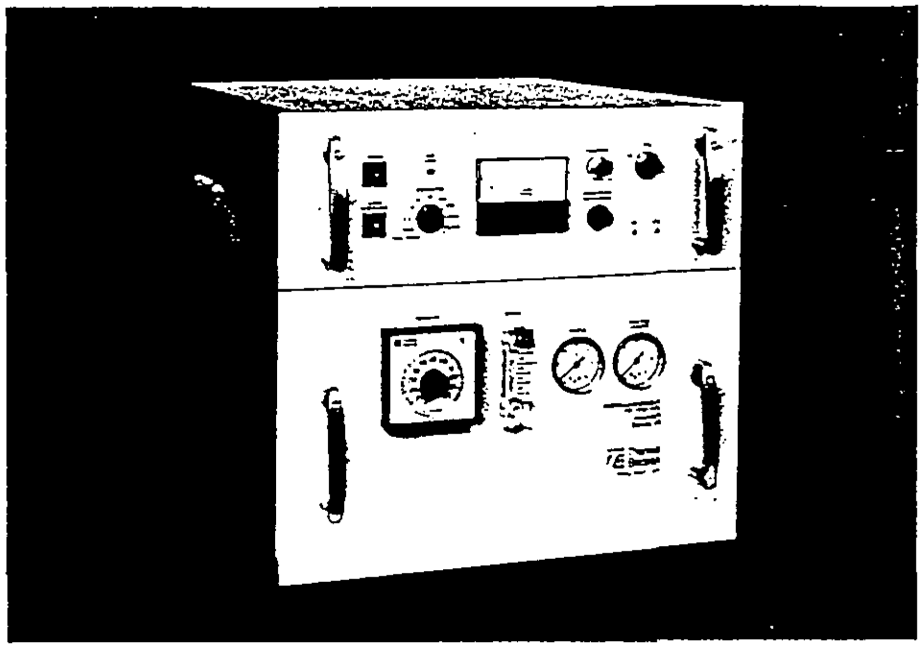
Gas Flow Diagram

Advantages

- Not cross-sensitive to most common gases
- Long lifetime
- Rugged design
- No routine cell maintenance

Thermo Electron
CORPORATION
Environmental Instruments Division

Chemiluminescent NO/NO_x Analyzer



Model 10
For Continuous Source Gas Monitoring

Thermo Electron's Model 10 NO/NO_x Analyzer is based on the chemiluminescent reaction between nitric oxide (NO) and ozone (O_3) according to the reaction:

$$NO + O_3 \rightarrow NO_2 + O_2 + h\nu$$

Light emission results when the electronically excited NO_2 molecules revert to their ground state.

A front panel mode switch provides for either a direct readout of the NO concentration in the sample being analyzed ("NO" mode) or the total NO_x concentration ("NO_x" mode). When the Model 10 is placed in the "NO_x" mode, the sample stream passes through a NO_x-to-NO converter prior to entering the reaction chamber for subsequent analysis.

Key Features

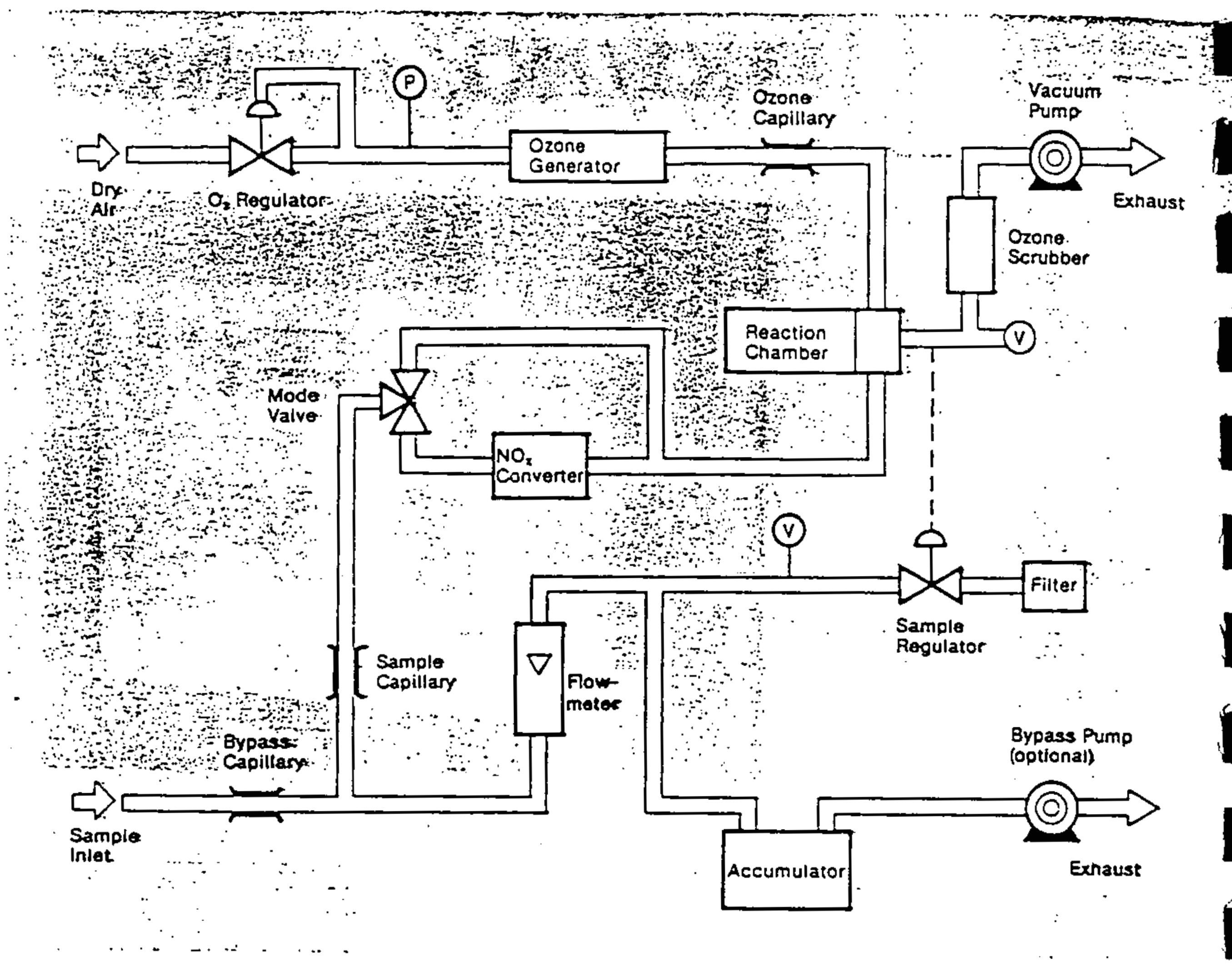
- Selective detection of NO or NO_x
- Eight ranges, from 2.5 to 10,000 ppm FS
- Continuous monitoring with rapid response
- Linear on all ranges
- Field proven reliability
- Insensitive to changes in sample flow

Model 10 Specifications*

Ranges	0–2.5 ppm, 0–10 ppm, 0–25 ppm, 0–100 ppm, 0–250 ppm, 0–1000 ppm, 0–2500 ppm, 0–10,000 ppm
Minimum Detectable Concentration	.05 ppm
Noise	Less than 1% of FS
Reproducibility	1% of FS
Operating Temperature Extremes	0–40°C
Response Time (0–90%)	~1.5 second NO mode ~1.7 second NO_x mode
Zero Stability	± 1 ppm in 24 hours
Span Stability	± 1% in 24 hours
Linearity	± 1% from 0.05 to 10,000 ppm**
Power Requirements	1000 watts, 115 ± 10 volts, 60 Hz standard. Also available in 115V 50 Hz, and 210 ± 15 volts, 50 Hz versions
Physical Dimensions	19" wide × 17" high × 20" deep
Instrument Weight	75 lbs. (including pump)
Outputs	Two standard outputs supplied: 1) 0–10V; 2) Field selectable from 0–10V, 5V, 1V, 100mV or 10mV. (ma options available.)

*Specifications are typical and subject to change without notice.
**With O_2 Feed: With dry air, linearity to 2000 ppm.

Model 10 Flow Scheme



As illustrated in the above diagram, sample gas enters the Model 10, flows through the bypass capillary, and divides. Most of the sample flows through the flowmeter, accumulator, bypass pump, and exhausts. Only a small amount of sample flows through the sample capillary for analysis. The bypass pump in conjunction with the sample regulator maintain a constant pressure differential across the sample capillary, thus maintaining constant sample flow for analysis. This plumbing network makes the analyzer insensitive to pressure fluctuation in the sample inlet.

From the sample capillary, the sample to be analyzed is either directed through the NO_x to NO converter or around it, depending on the choice of the operator. In the reaction chamber the sample reacts with ozone to produce the light emission and is exhausted. The ozone is produced internally from dry air entering through the oxygen regulator and ozonator. The light emission is sensed by the photomultiplier tube and amplified.

Options

10-001 Bypass pump assembly includes pump, snock tray, accumulator, tubing, and fittings.

Accessory Instruments

Model 700 Heated Capillary Module
Model 606H Heated Particulate Filter
Model 800 Sample Gas Conditioner
Model 900 Sample Gas Conditioner

Thermo Electron
CORPORATION

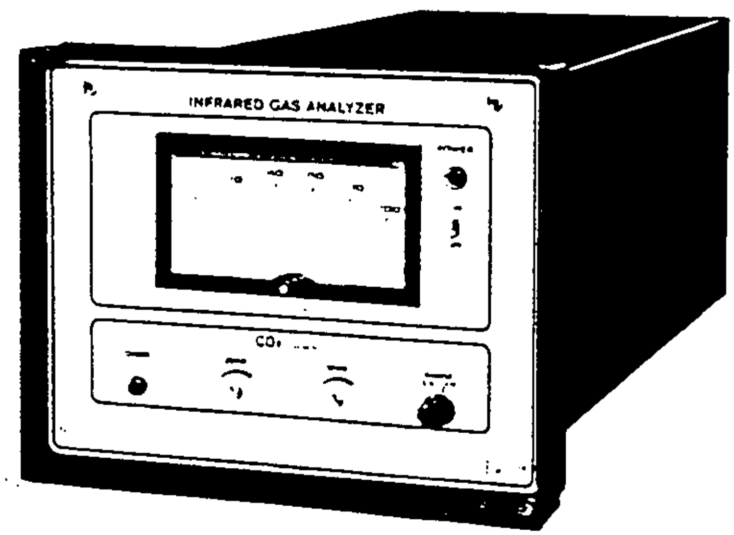
Environmental Instruments Division

108 South Street
Hopkinton, MA 01748
Telephone (617) 435-5321
Telex 948325

Environmental Products

FUJI 730

NDIR SINGLE GAS ANALYZER



Analog Display Shown,
Digital Display Available

- Unique Mass Flow Sensor System Eliminates Interference
- Ideal For Applications In
  - Combustion Monitoring/Control
  - Hydrocarbon Monitoring
- Measures In Two Ranges
  - Carbon Monoxide (CO)
  - Carbon Dioxide (CO_2)
  - Methane (CH_4)
- Designed For Continuous Operation and Low Maintenance

The unique Mass Flow Sensor used in the Fuji 730 Single Gas Analyzer provides significant advantages over other sensors used for this purpose. The design of the Mass Flow Detector minimizes the adverse effects of vibration which is often present in harsh environments. In addition, the Mass Flow Sensor System virtually eliminates interference making the Fuji 730 a powerful analytical tool for monitoring burner and boiler efficiency, heat treatment, fermentation, well logging and many other applications which require exceptional accuracy, stability, high sensitivity and reliability.

See specifications on reverse side

FUJI 730 SINGLE GAS ANALYZER

PRINCIPLE OF OPERATION

The Fuji 730 Series Analyzers use the infrared absorption characteristic of gases to measure the concentration of gas samples. An efficient single beam design which incorporates a unique mass flow sensor system insures accurate and interference free analysis for a wide variety of applications.

A single beam of infrared energy is chopped and passed through a sample cell containing the flowing gas sample. Due to the absorption characteristic, the amount of energy in the beam is reduced by the concentration of the measured gas in the sample. The attenuated infrared beam is passed serially through the two cavities of the mass flow sensor which contain a high concentration of the gas species the analyzer is intended to measure. The two cavity sensor performs two functions in the analyzing process, it first eliminates interference caused by other gases and water vapor by detecting and subtracting the interference component from the detector output, and secondly, produces an output signal which represents an accurate duplication of the relative infrared energy absorption. this resultant signal is electronically processed and linearized to provide an electrical signal which drives meters and other output devices.

STANDARD GASES

Carbon Monoxide (CO)
Carbon Dioxide (CO_2)
Methane (CH_4)

STANDARD RANGES

0 - 500/1000 ppm
0 - 1000/2000 ppm
0 - 2000/5000 ppm
0 - 2500/5000 ppm

0-0.5/1.0%
0-1/2%
0-2/5%
0-5/10%
1-10/20%

PURGE GAS FITTING

Standard Equipment

INTERNAL SPAN CHECK FEATURE

Calibration check without the use of span gases. Conserves gas and reduces operating costs.

SPECIFICATIONS

Repeatability
±0.5% of full scale (low range)
±1.0% of full scale (high range)

Zero Drift*
±1% of full scale per 24 hours

Span Drift*
±1% of full scale per 24 hours

Linearity
±2% of full scale (with linearizer)

Noise Level
0.5% of full scale

Speed of Response
90% indication

Electrical
2,3 or 5 seconds (field selectable)

Pneumatic
less than 15 seconds (depending on cell length)

Warm-Up
Two hours (to ±2% full scale)

Internal Span Check
Manually activated from front panel

Outputs
0 to 1V DC, linear & 4-20mA DC, linear

Ambient Temperature Range
23 to 113°F (−5 to 45°C)

Ambient Humidity
To 90% R.H. (non-condensing)

Sample Gas Temperature
32 to 122°F (0 to 50°C)

Sample Gas Flow Rate
2 ±1 scfh (1.0 ±0.5 slpm)

Purge Gas Rate (where necessary)
2 scfh (1 slpm) when required

Power Requirements
115V AC±10%, 60 Hz, 30VA

Gas Connections
All ¼" compression-type tube fittings

Size and Weight
7.9 (H) x 9.8 (W) x 21.3 (D) inches
(200 x 250 x 541 mm)
24.2 pounds (11 kg)

*constant conditions

Environmental Products

PACE ENVIRONMENTAL PRODU(
A Division of PACE Associates, Inc.
1196 Easton Road
Horsham, PA 19044
Phone: (215) 957-1144
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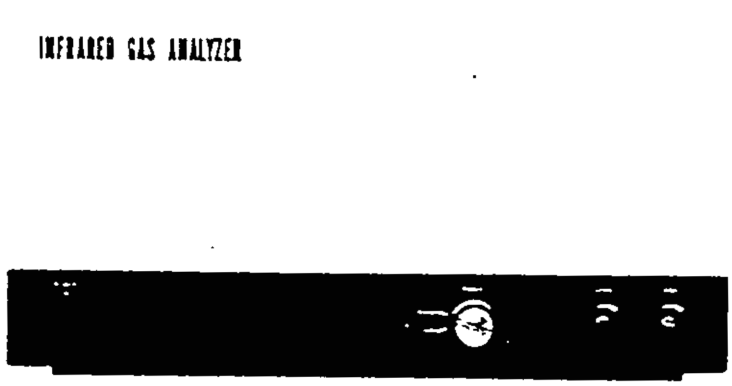
FUJI 760

NDIR GAS ANALYZER



Bench Top or Rack Mount
Available

- Unique Mass Flow Sensor System Eliminates Interference
- Wide Dynamic Range Permits Ultra-Sensitive and High Concentration Gas Analysis
- Measures
  - Carbon Monoxide (CO)
  - Carbon Dioxide (CO_2)
  - Sulfur Dioxide (SO_2)
  - Nitric Oxide (NO)
  - Methane (CH_4)
- Designed For Continuous Operation and Low Maintenance
- Insensitive to Vibration

This instrument is designed for stack monitoring and process control applications. It's remarkable accuracy and fast reponse makes it an ideal instrument for CEMS, boiler control equipment, research labs and many other monitoring applications. For usage requiring ultra sensitive measurement, the Fuji 760 delivers superior performance. Using the Non-Dispersive Infrared (NDIR) Mass Flow Detector, low concentration measurements are accurate and reliable. The Fuji 760 incorporates an Interference Compensating Detector which minimizes the effects of other gases, particularly when operating in ranges of high sensitivity.

Warranty
Whittaker warrants each new gas analyzer of its manufacture to be free of defects in material and workmanship for one year from the date of delivery. For full warranty information, contact your representative.

See specifications on reverse side

FUJI 760 Gas Analyzer

FEATURES OF THE FUJI-760

The Fuji 760 Analyzer uses infrared absorption techniques to measure gas concentrations, however, many innovative patented features make this instrument far superior to conventional Non Dispersive Infrared Analyzers. Among its unique features are an optical chopper design which virtually eliminates the effects of vibration and resultant optical noise; a mass flow sensor system which reduces the effects of interfering gases to insignificant levels, thus permitting gas analysis at low concentration ranges; and a dual beam optical system derived from a single infrared source which enhances long term stability.

PRINCIPLE OF OPERATION

A single beam of infrared energy is modulated and split into two parallel beams by a distribution cell. One beam is passed through a reference cell containing a non-absorbing gas, and the other beam is passed through a cell containing the sample gas being measured. The beam passing through the sample cell is attenuated by the amount of gas concentration in the sample and compared against the unattenuated reference beam by the mass flow detector system. One set of detectors sense the amount of sample gas as compared against the reference, the second set of detectors measure and cancel interferents in the sample. The outputs of the detectors are electronically processed and conditioned into useable signals for indicators and other output devices.

Detectable Gas Ranges

Standard Configuration

Component	Minimum Range
Carbon Monoxide (CO)	0 to 100 ppm
Carbon Dioxide (CO_2)	0 to 50 ppm
Nitric Oxide (NO)	0 to 100 ppm
Sulfur Dioxide (SO_2)	0 to 100 ppm
Total Hydrocarbons	0 to 500 ppm

Other Gases can be measured. Call our applications engineer or your local sales representative to discuss the suitability for your specific needs.

Specifications
(Standard Configuration)

Repeatability
± 0.5% of full scale

Zero Drift
± 2% of full scale per week

Span Drift
± 2% of full scale per week

Linearity
± 2% of full scale

Speed of Response
90% indication within 5 seconds (Electronic Response)

Range Selection
Either of two ranges selected by front pa[nel] switch or external contact closure.

Warm-Up
Four hours minimum

Outputs
0 to 1V DC, linear and 4-20mA DC, linear

Ambient Temperature Range
23 to 113°F (−5 to 45°C)

Ambient Humidity
To 90% R.H. (non-condensing)

Sample Gas Temperature
32 to 122°F (0 to 50°C)

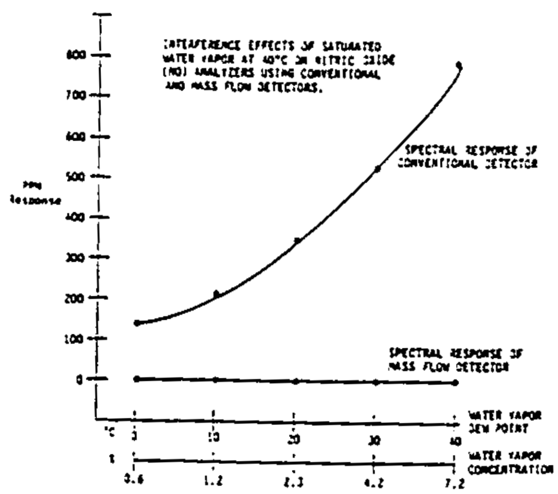
Sample Gas Flow Rate
1.0 ±0.5 scfh (0.50 ± 0.25 slpm) for standard configuration

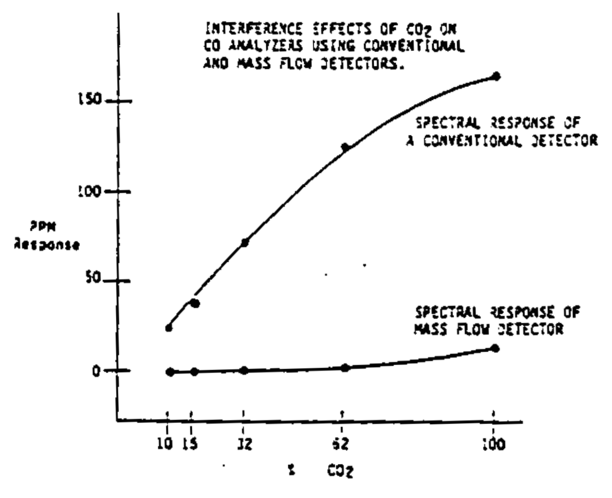
Materials in Contact with Sample
304 stainless steel, neoprene rubber, rubber, CaF_2/ sapphire, Teflon®

Power Requirements
115V AC ±10%, 50/60 Hz (switch selectable)
110 VA max. (200VA max with converter).
220V AC available

Gas Connections
All ¼ inch compression-type tube fittings

Size and Weight
3.66 (H) x 17.44 (W) x 16.78 (D) inches
(220 x 443 x 350 mm).
37.4 pounds (17 kg).



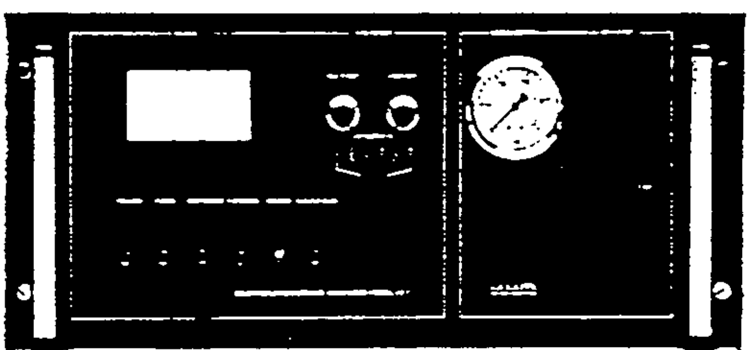


PACE ENVIRONMENTAL PRODUCTS
A DIVISION OF PACE ASSOCIATES, INC.
1196 EASTON ROAD
HORSHAM, PA 19044
PHONE: (215) 957-1144

J.U.M.®
ENGINEERING

HEATED TOTAL HYDROCARBON ANALYZER

MODEL VE 7



- All heated components
- Integrated heated sample pump
- Permanent heated stainless steel 2 micron sample filter
- Built in burner air supply- no extra bottles needed
- Automatic fuel enrichment for ignition
- 19 inch relay rack mount
- 1% precision full scale
- Response time- 90% full scale within 1 second

The J.U.M. Engineering Model VE 7 is a high accuracy Total Hydrocarbon Analyzer for the measurement and analysis of organic vapors.

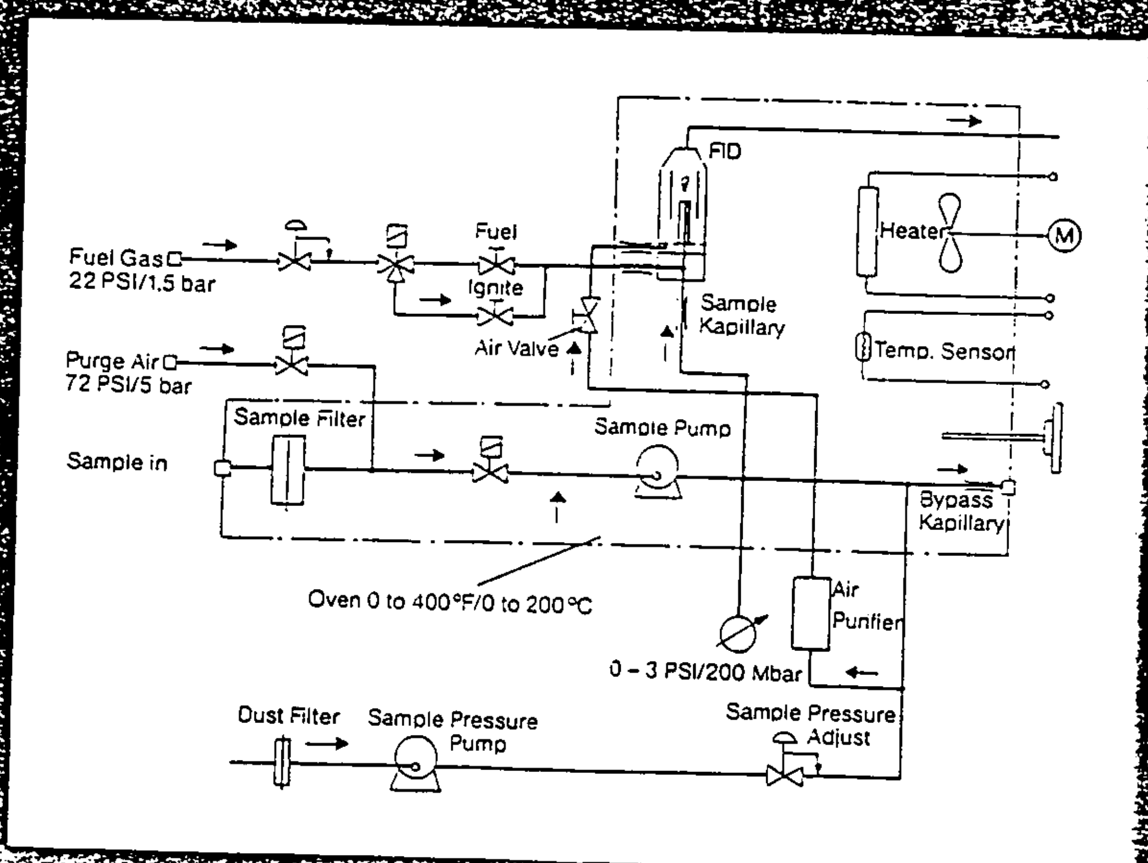
The VE 7 utilizes a Hydrogen Flame Ionization Detector (FID) in a thermostatically controlled oven to prevent the loss of high molecular weight hydrocarbons.

Options

Digital display with BCD output/without BCD output
Remote range control and range I.D.
Recorder output of oven temperature

STANDARD SPECIFICATIONS:

Analysis Method:	Flame Ionization Detector (FID)
Sensitivity:	Max. 1 ppm CH
Response Time:	90% of full scale in less than one second
Zero Drift:	1% of full scale per 24 hours
Span Drift:	1% of full scale per 24 hours
Linearity:	Within 1%
Oxygen Synergism:	Less than 1% of selected range
Ranges:	Any three of the following: 0 – 10; 100; 1000; 10,000; 100,000 ppm
Outputs:	0 – 10 Volts D.C.
Display:	Analog Meter in ppm Hydrocarbon or in % LEL
Zero/Span Adjust:	Manual on front panel
Fuel Consumption:	Hydrogen: 20 cc/min at 22 psig (1.5 Bar); Hydrogen/Helium 40/60 mix: 80 cc/min
Air Consumption:	None; Integral Air generator
Zero & Span Gas:	3 psig (200 m Bar)
Sample Pump:	All Stainless Steel heated, 3 liters per minute at operating temperature
Sample Pressure:	By Integral Pump 3 psig (200 m Bar)
Sample Filter:	Permanent all stainless steel, 2 micron back-purged for cleaning
Analysis Temperature:	Adjustable 200 to 400°F (93 to 204°C)
Power Requirements:	110 Volts, 60 Hertz AC, 800 Watts (others on request)
Ambient Temperature:	32°F to 110°F (0 to 43°C)
Dimensions:	Width: 483 mm (19 inches); Depth: 460 mm (18-1/8 inches); Height: 221 mm (8-3/4 inches)
Weight:	38.6 lbs. (17.5 kg)
Shipping Weight:	53 lbs. (24 kg)



VI. LABORATORY ANALYSIS

A. PAH ANALYSIS

TRIANGLE LABORATORIES, INC.
801 Capitola Drive
Durham, NC 27713
Telephone: (919) 544-5729

DATA FILE:FE815
RF FILE: FE807
DATE: 09/30/91
TLI Project Number: 18976
ANALYSIS DATE: 09/19/91

SAMPLE ID: RUN #1
DILN FACTOR: 1
TLI Sample ID: 46.060.1A.H

QUANTITATION REPORT

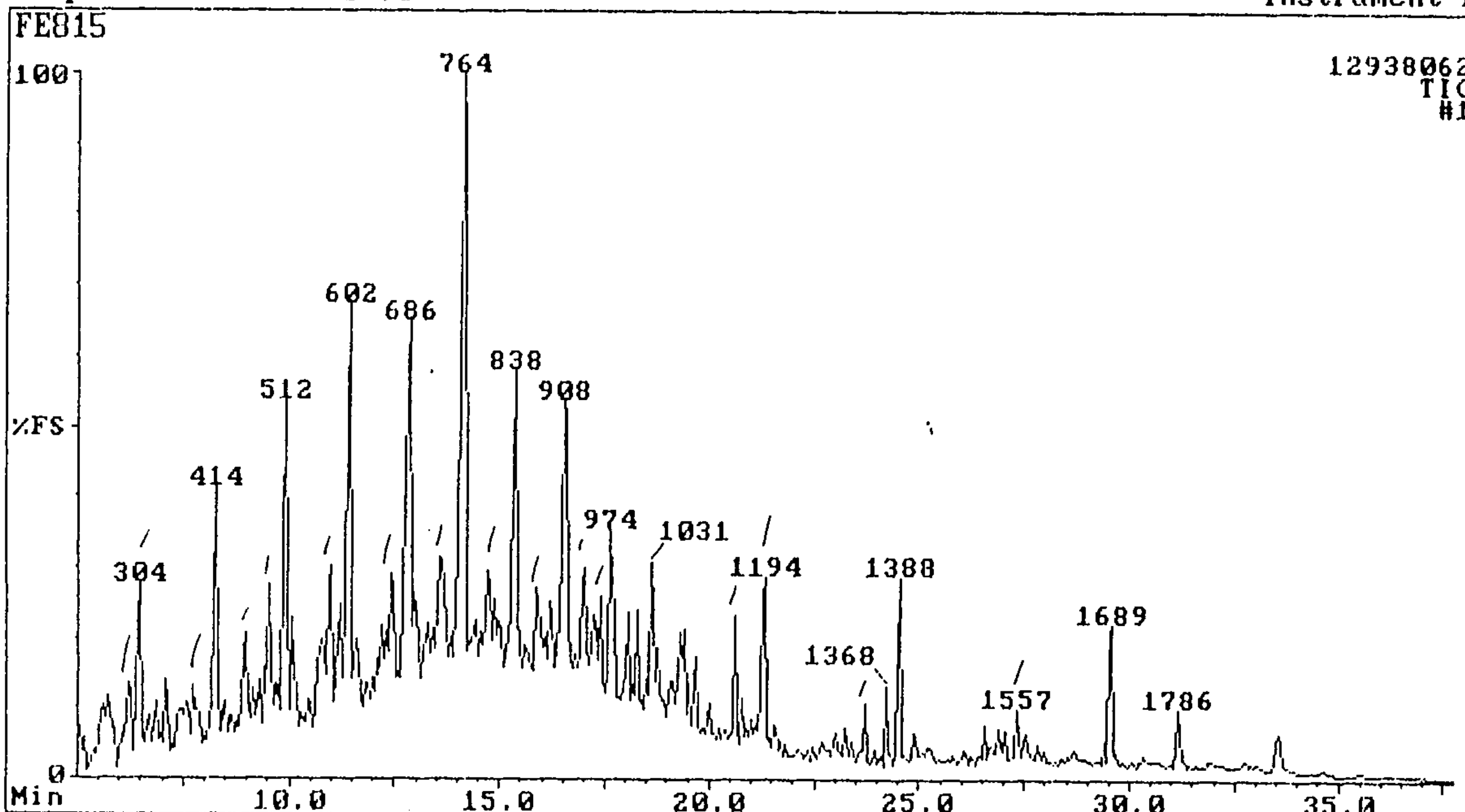
NAME	AREA	RF	SCAN	ISID	AMOUNT, ug	CODE	QUAN LIMIT
1,4-Dichlorobenzene-d4	1456		309	1		IS	
Naphthalene-d8	6130		483	14		IS	
Naphthalene	44684	.9104	487	14	320.28	D	10
2-Methylnaphthalene	17973	.7186	589	14	163.20	D	10
Acenaphthene-d10	5247		736	28		IS	
2-Chloronaphthalene	0	.9327	0	28	.16	ND	10
Acenaphthylene	19639	1.5120	714	28	99.02	D	10
Acenaphthene	0	1.0072	0	28	.15	ND	10
Fluorene	5565	.9405	816	28	45.11	D	10
Phenanthrene-d10	11012		950	47		IS	
Phenanthrene	7446	1.0774	953	47	25.10	D	10
Anthracene	940	1.0176	960	47	3.36	E	10
Fluoranthene	755	1.1700	1123	47	2.34	E	10
Chrysene-d12	9089		1338	57		IS	
Pyrene	813	.9377	1154	57	3.82	E	10
Benzo(a)anthracene	0	1.0234	0	57	.09	ND	10
Chrysene	0	1.0396	0	57	.08	ND	10
Perylene-d12	9237		1557	64		IS	
Benzo(b)fluoranthene	0	.8831	0	64	.10	ND	10
Benzo(k)fluoranthene	0	.9783	0	64	.09	ND	10
Benzo(e)pyrene	0	.8487	0	64	.10	ND	10
Benzo(a)pyrene	0	.9448	0	64	.09	ND	10
Perylene	0	.5627	0	64	.15	ND	10
Indeno(1,2,3-cd)pyrene	0	.8595	0	64	.10	ND	10
Dibenz(a,h)anthracene	0	.9225	0	64	.09	ND	10
Benzo(g,h,i)perylene	0	.9620	0	64	.09	ND	10

SURROGATE SUMMARY

	AREA	RF	SCAN	ISID	AMOUNT	CODE	% RECOVERY
Terphenyl-d14	19703	.6288	1195	57	137.90	D	137.9
Anthracene-d10	18508	.9242	958	47	72.74	D	72.7
Pyrene-d10	20384	.6547	1152	57	137.02	D	137.0
Phenol-d5	3210	1.1959	281	1	73.73	D	73.7
2,4,6-Tribromophenol	2039	.0779	852	28	199.50	D	199.5
1,4-Dibromobenzene-d4	1800	.4698	492	1	105.27	D	105.3

CODES: ND = Not Detected; D = Detected; E = Estimated; IS = Internal Standard

19-Sep-91 18:36 Triangle Labs, Inc. (919) 544-5729
Sample:RUN#1 18976 Instrument F

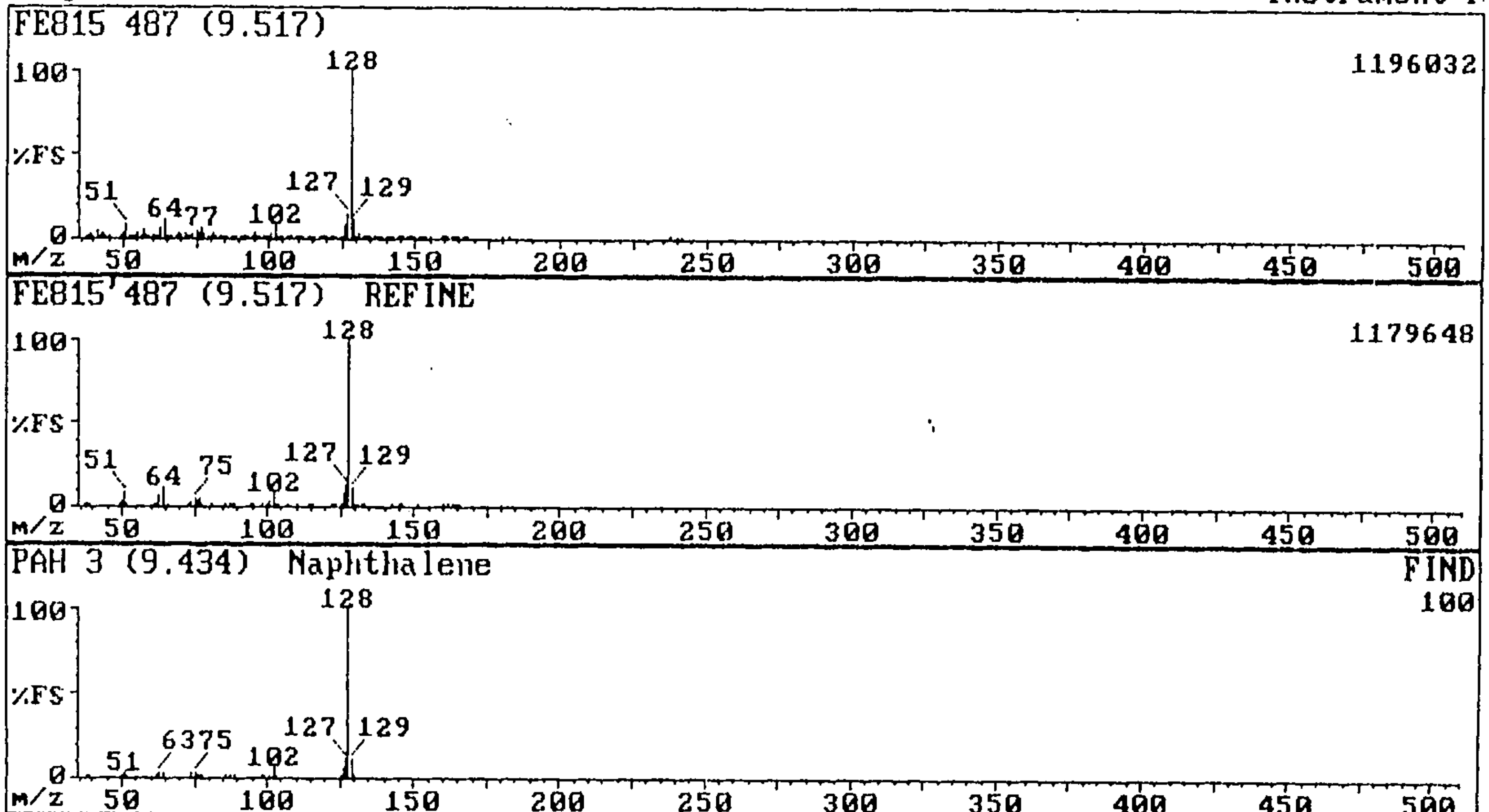


QUAN DB : FE815 LAB-BASE QUAN 19-Sep-91 22:55

N	MAT	FOR	REV	Delta	Area	F.Flags	Scan	QM	Name
1	49	33	87	5	145630	bb	309	152	1.4 Dichlorobenzene-d4
2	45	23	77	-4	612980	vv	483	136	Naphthalene-d8
3	92	74	97	2	4468400	bv	487	128	Naphthalene
4	83	54	89	1	1797300	vv	589	142	2-Methylnaphthalene
5	64	24	79	0	524690	bv	736	164	Acenaphthene-d10
6	0	0	0	0	0		0	162	2-Chloronaphthalene
7	88	44	97	0	1963900	vv	714	152	Acenaphthylene
8	0	0	0	0	0		0	153	Acenaphthene
9	70	31	81	0	556540	vv	816	166	Fluorene
10	76	31	91	0	1101200	vv	950	188	Phenanthrene-d10
11	74	26	93	0	744640	vv	953	178	Phenanthrene
12	51	11	76	-1	94013	vv	960	178	Anthracene
13	41	15	77	-4	75497	vv	1123	202	Fluoranthene
14	57	64	94	-6	908920	vb	1338	240	Chrysene-d12
15	85	61	98	2	1970300	vb	1195	244	Terphenyl-d14
16	50	13	80	2	81330	bv	1154	202	Pyrene
17	0	0	0	0	0		0	228	Benzo(a)anthracene
18	0	0	0	0	0		0	228	Chrysene
19	89	61	93	1	923710	bb	1557	264	Perylene-d12
20	0	0	0	0	0		0	252	Benzo(b)fluoranthene
21	0	0	0	0	0		0	252	Benzo(k)fluoranthene
22	0	0	0	0	0		0	252	Benzo(e)pyrene
23	0	0	0	0	0		0	252	Benzo(a)pyrene
24	0	0	0	0	0		0	252	Perylene
25	0	0	0	0	0		0	276	Indeno(1,2,3-cd)pyrene
26	0	0	0	0	0		0	278	Dibenz(a,h)anthracene
27	0	0	0	0	0		0	276	Benzo(g,h,i)perylene
28	0	0	0	0	0		0	266	Pentachlorophenol
29	66	38	85	2	368940	bv	386	82	Nitrobenzene-d5
30	64	36	75	-1	864220	bv	648	172	2-Fluorobiphenyl
31	64	21	82	0	203860	bb	852	330	2,4,6-Tribromophenol
32	61	37	86	3	321030	bb	281	99	Phenol-d5
33	79	63	97	3	2038400	vv	1152	212	Pyrene-d10
34	91	49	96	0	1850800	vv	958	188	Anthracene-d10
35	52	18	87	-3	180050	bb	492	240	1,4-Dibromobenzene-d4
36	62	30	76	1	234520	bb	433	185	1,3,5-Trichlorobenzene-d3

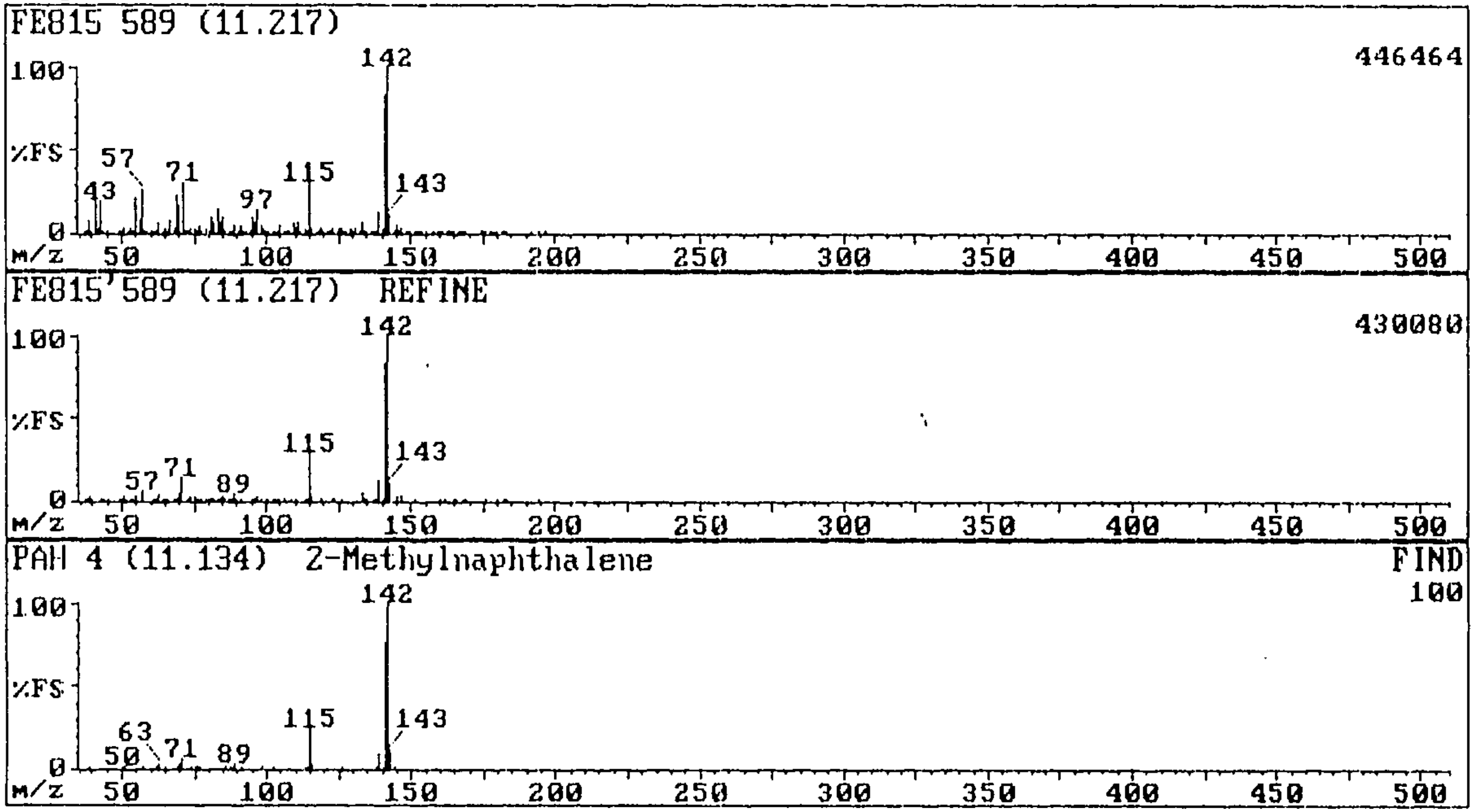
19-Sep-91 18:36 Triangle Labs, Inc. (919) 544-5729

Sample:RUN#1 18976 Instrument F



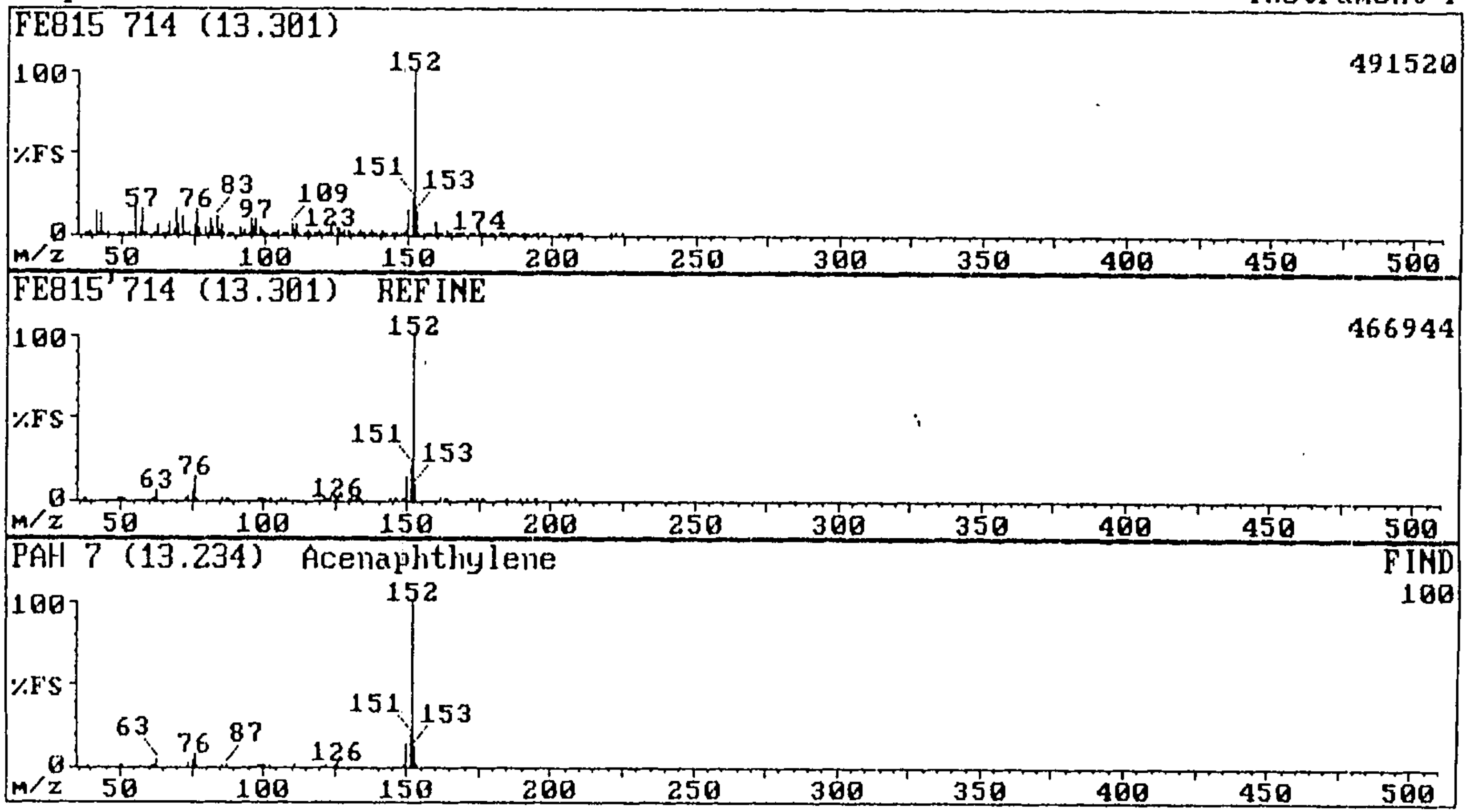
19-Sep-91 18:36 Triangle Labs, Inc. (919) 544-5729

Sample:RUN#1 18976 Instrument F



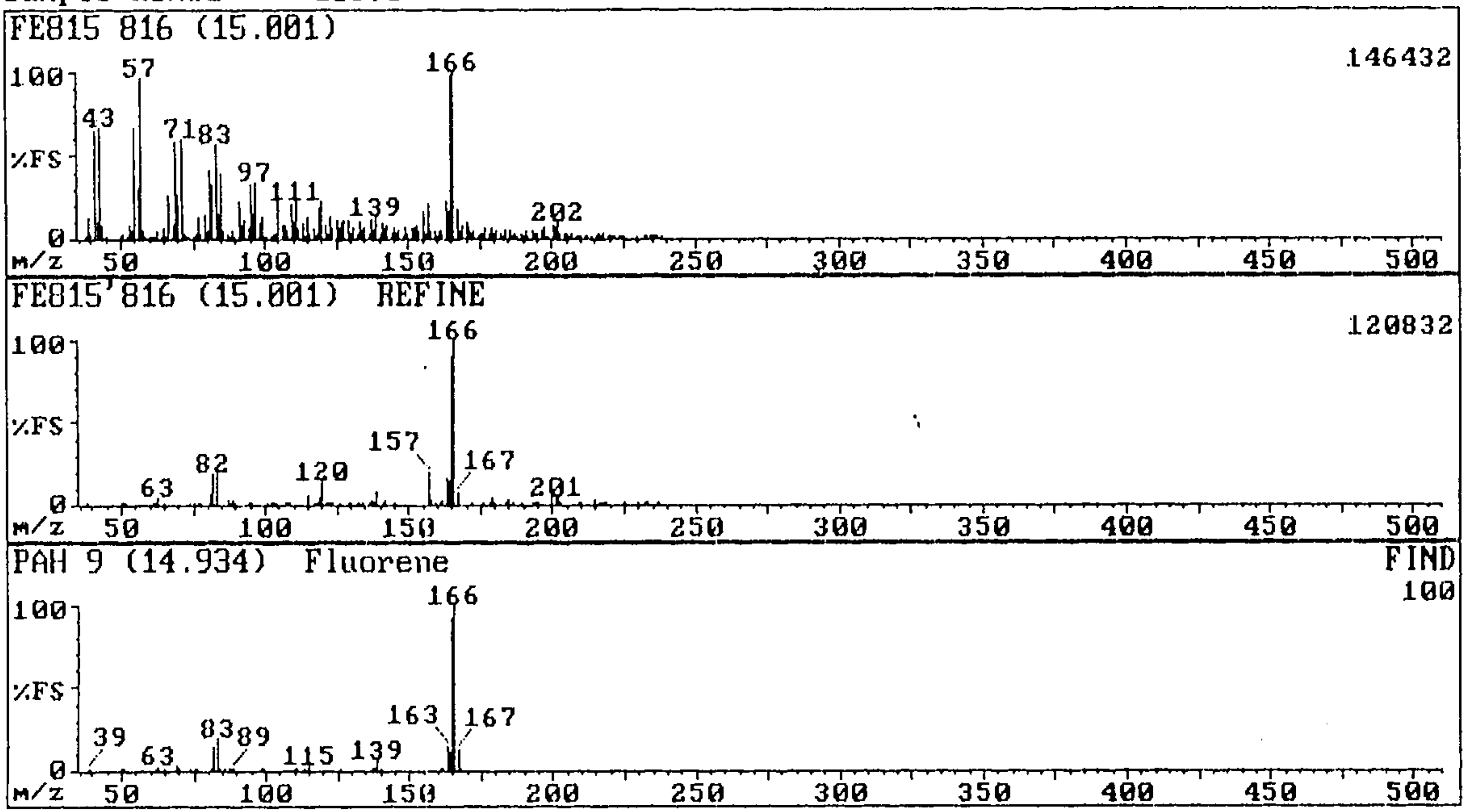
19-Sep-91 18:36 Triangle Labs, Inc. (919) 544-5729

Sample:RUN#1 18976 Instrument F



19-Sep-91 18:36 Triangle Labs, Inc. (919) 544-5729

Sample:RUN#1 18976 Instrument F



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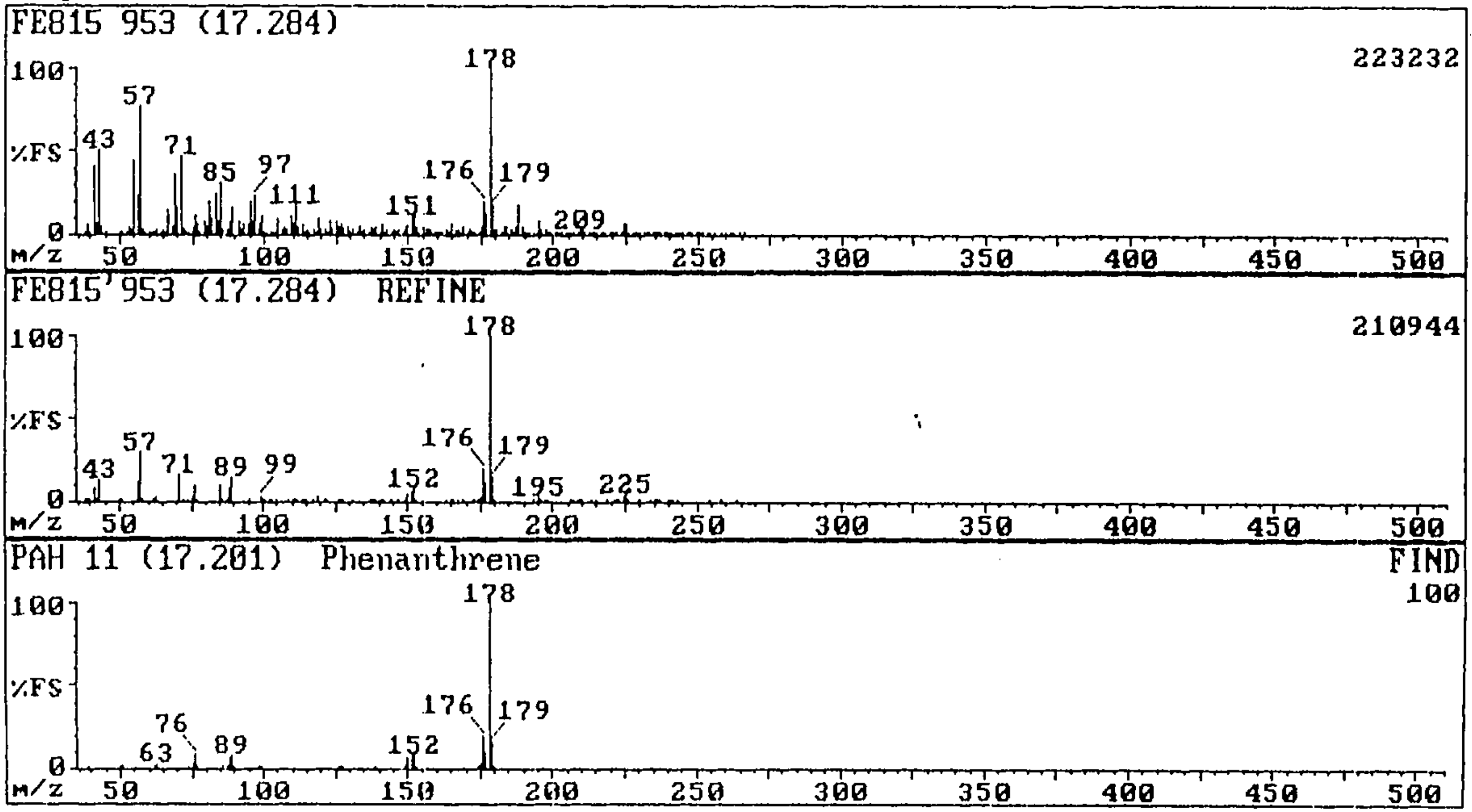
Sample:RUN#1 18976 Instrument F



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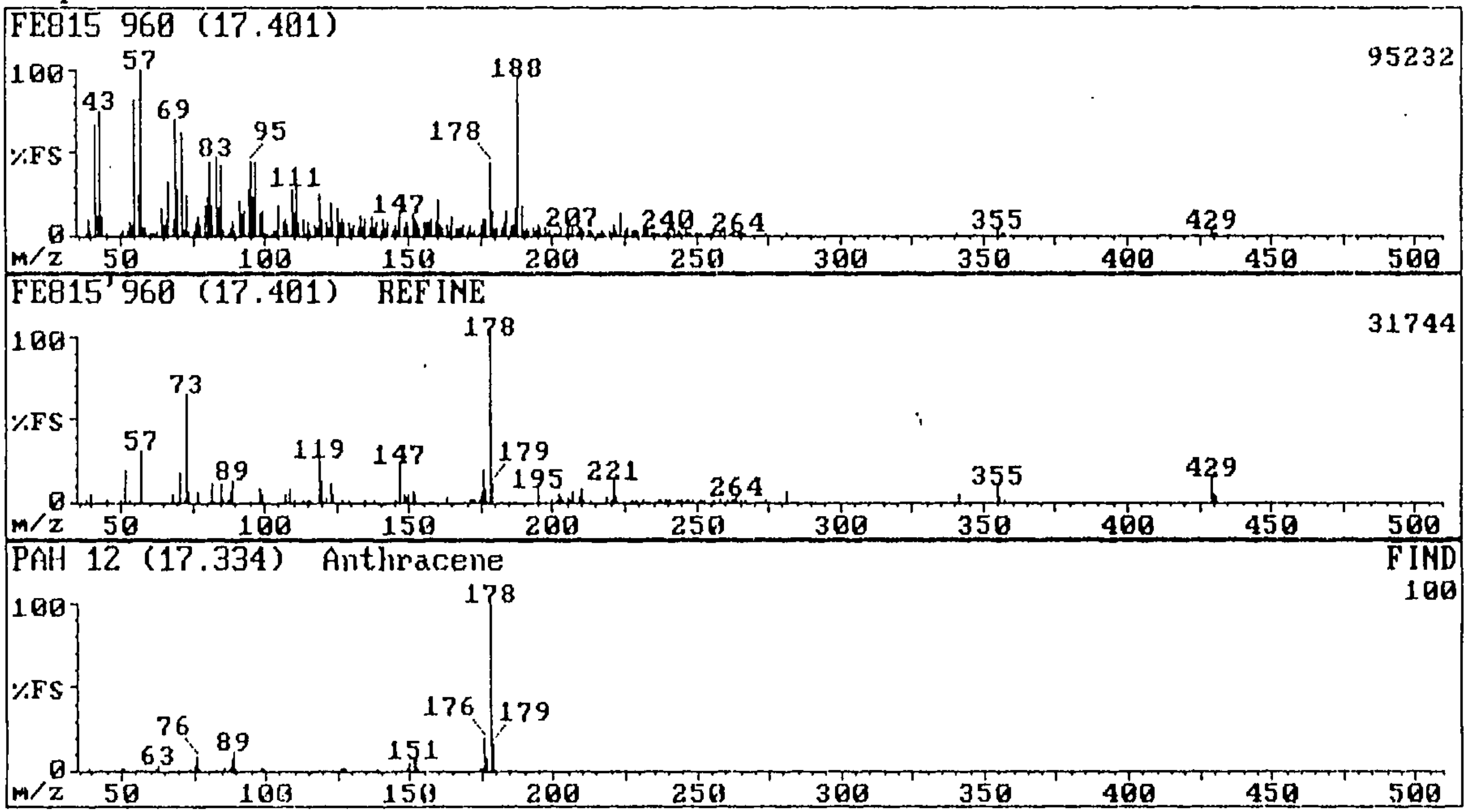

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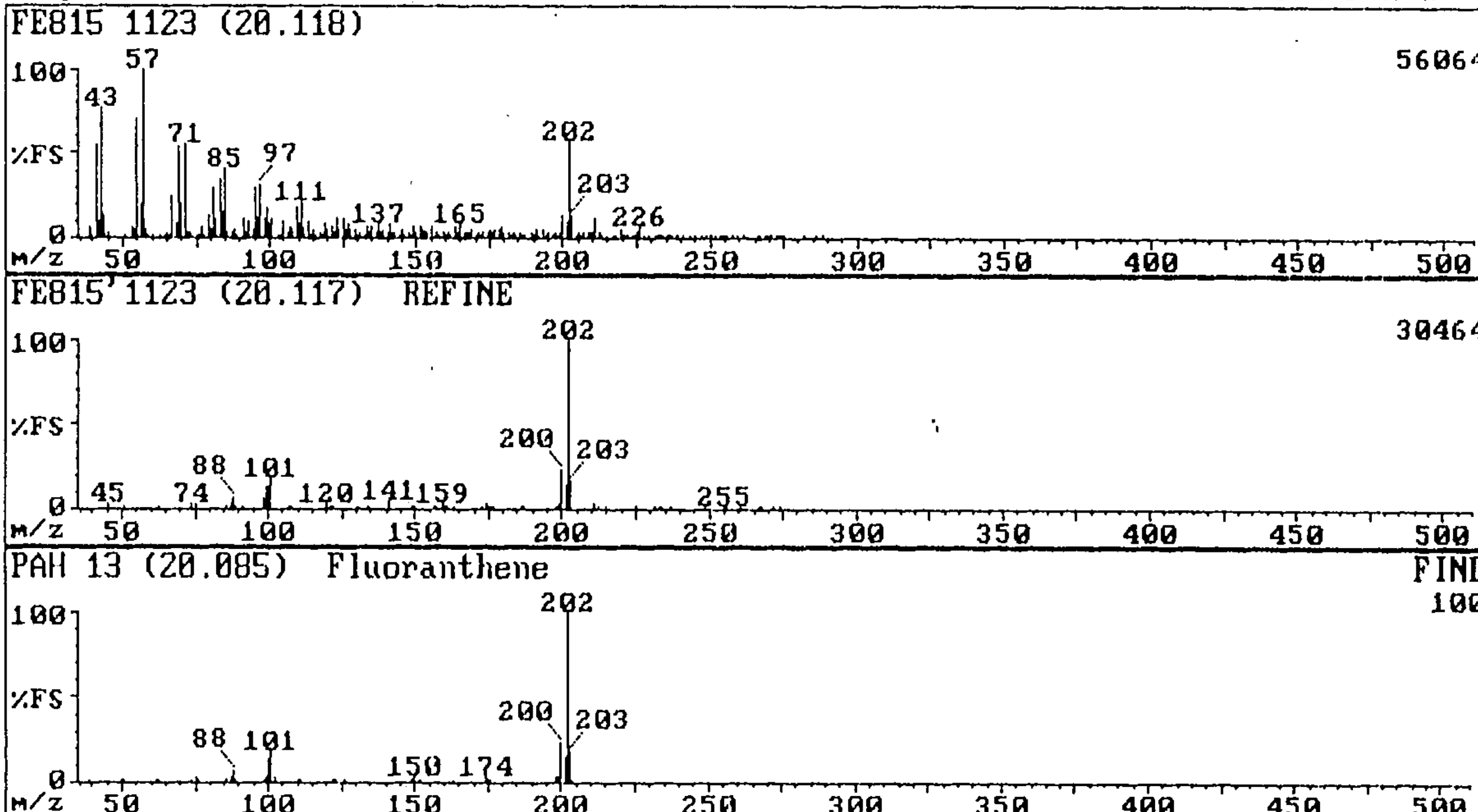

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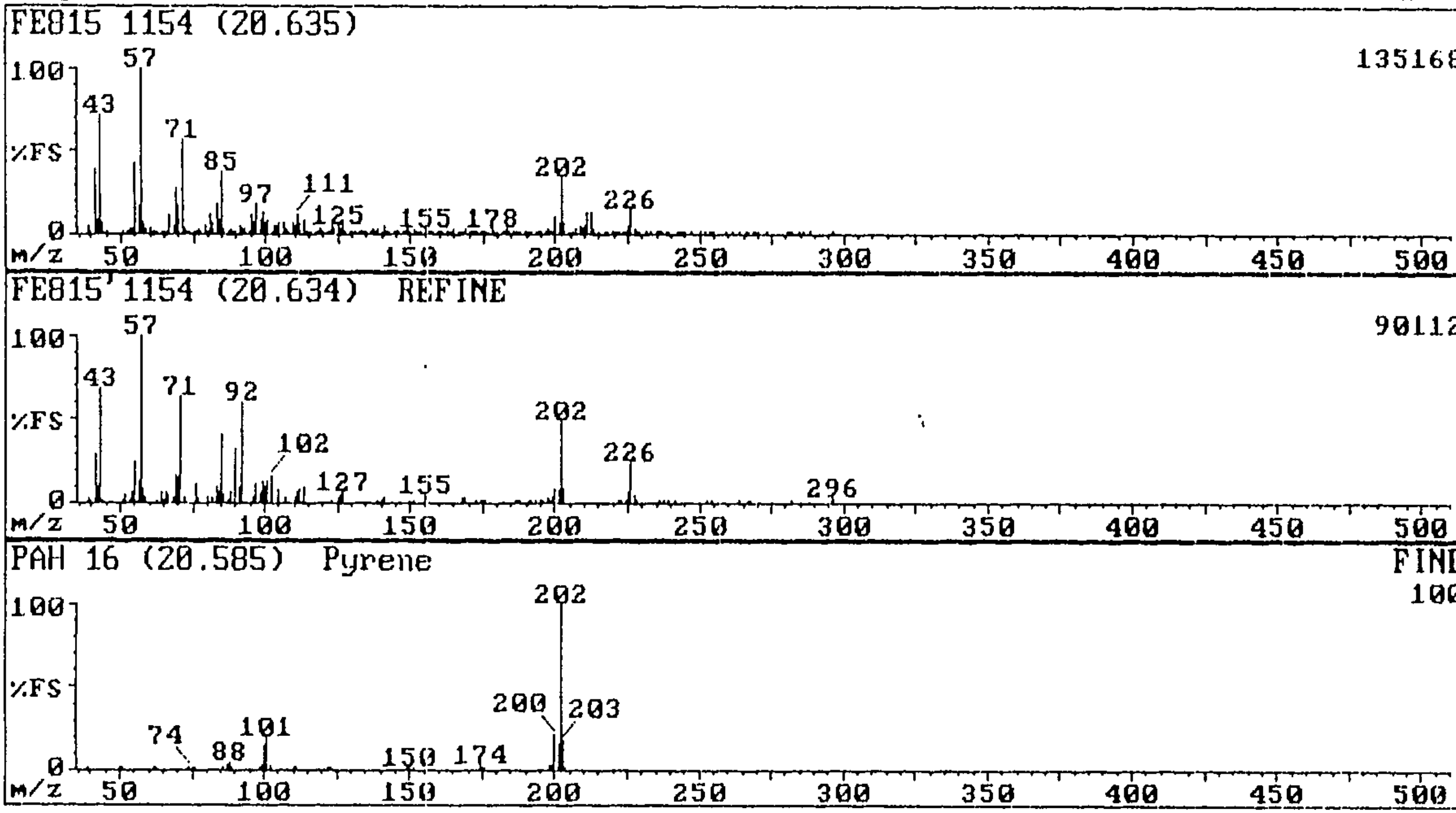
Sample:RUN#1 18976 Instrument F



TRIANGLE LABORATORIES, INC.
801 Capitola Drive
Durham, NC 27713
Telephone: (919) 544-5729

DATA FILE:FE907
RF FILE: FE901
DATE: 09/30/91
TLI Project Number: 18976
ANALYSIS DATE: 09/25/91

SAMPLE ID: RUN #1 (1:4 dil.)
DILN FACTOR: 4
TLI Sample ID: 46.060.1A.H

Q U A N T I T A T I O N R E P O R T

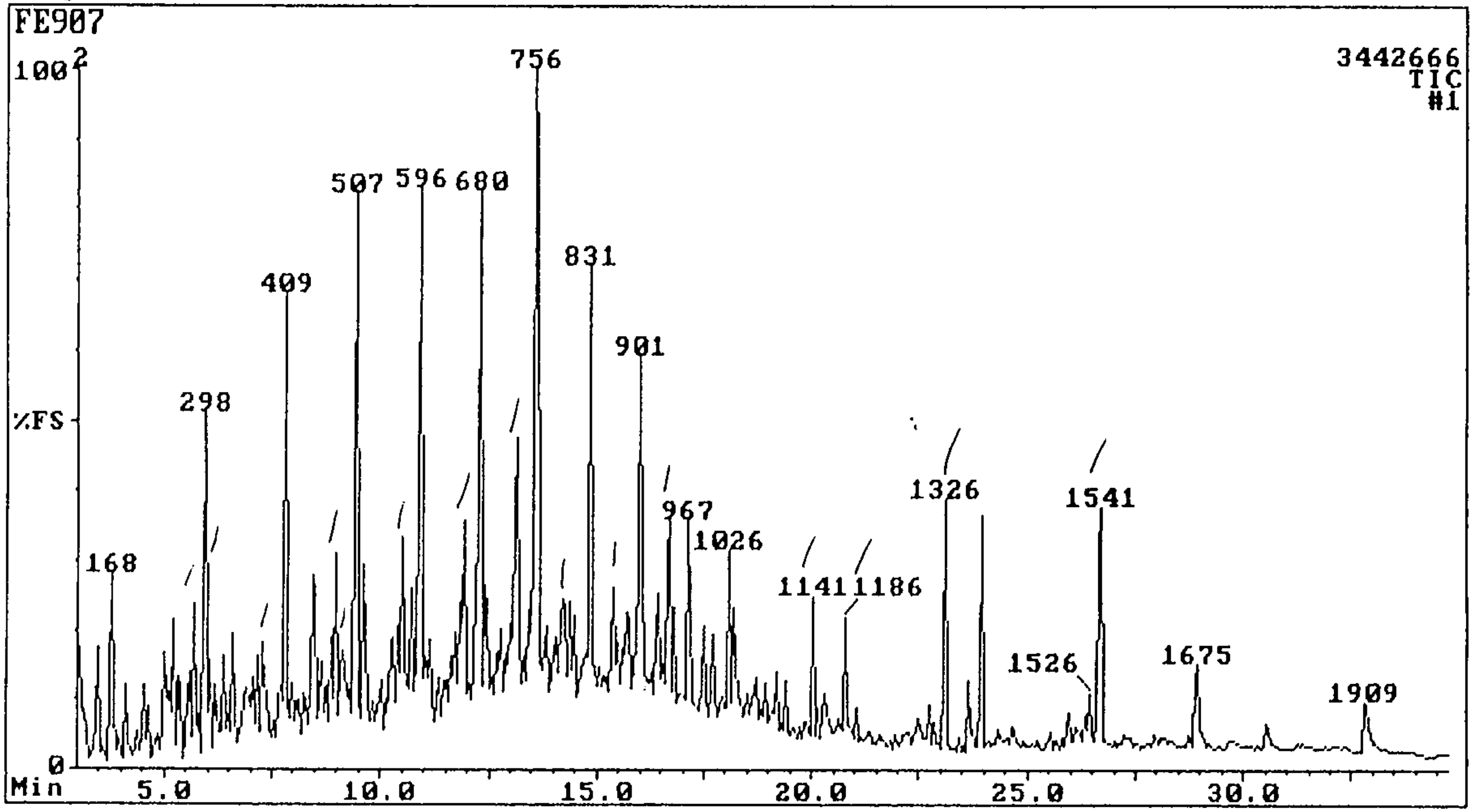
NAME	AREA	RF	SCAN	ISID	AMOUNT, ug	CODE	QUAN LIMIT
1,4-Dichlorobenzene-d4	1433		302	1		IS	
Naphthalene-d8	5092		478	14		IS	
Naphthalene	9158	.9408	480	14	305.86	D	40
2-Methylnaphthalene	3346	.7942	582	14	132.36	D	40
Acenaphthene-d10	3583		729	28		IS	
2-Chloronaphthalene	0	.9237	0	28	.97	ND	40
Acenaphthylene	3519	1.5395	707	28	102.05	D	40
Acenaphthene	0	.9778	0	28	.91	ND	40
Fluorene	921	1.1415	808	28	36.02	E	40
Phenanthrene-d10	7116		941	47		IS	
Phenanthrene	1195	.8666	943	47	31.01	E	40
Anthracene	0	.8724	0	47	.52	ND	40
Fluoranthene	193	1.3003	1113	47	3.33	E	40
Chrysene-d12	11953		1326	57		IS	
Pyrene	200	1.1620	1143	57	2.31	E	40
Benzo(a)anthracene	0	1.0992	0	57	.24	ND	40
Chrysene	0	1.0178	0	57	.26	ND	40
Perylene-d12	13687		1541	64		IS	
Benzo(b)fluoranthene	0	.9739	0	64	.24	ND	40
Benzo(k)fluoranthene	0	1.1928	0	64	.20	ND	40
Benzo(e)pyrene	0	.9749	0	64	.24	ND	40
Benzo(a)pyrene	0	1.0228	0	64	.23	ND	40
Perylene	0	.5802	0	64	.40	ND	40
Indeno(1,2,3-cd)pyrene	0	.8098	0	64	.29	ND	40
Dibenz(a,h)anthracene	0	.8430	0	64	.28	ND	40
Benzo(g,h,i)perylene	0	.9214	0	64	.25	ND	40

S U R R O G A T E S U M M A R Y

	AREA	RF	SCAN	ISID	AMOUNT	CODE	% RECOVERY
Terphenyl-d14	4602	.8179	1186	57	75.31	D	75.3
Anthracene-d10	3327	.8804	948	47	84.95	D	85.0
Pyrene-d10	4763	.8714	1141	57	73.17	D	73.2
Phenol-d5	984	1.5876	273	1	69.18	D	69.2
2,4,6-Tribromophenol	248	.1108	843	28	100.00	D	100.0
1,4-Dibromobenzene-d4	478	.6186	486	1	86.24	D	86.2

CODES: ND = Not Detected; D = Detected; E = Estimated; IS = Internal Standard

25-Sep-91 13:34 Triangle Labs, Inc. (919) 544-5729
Sample:RUN#1 (1:4 DIL.) 18976 Instrument F

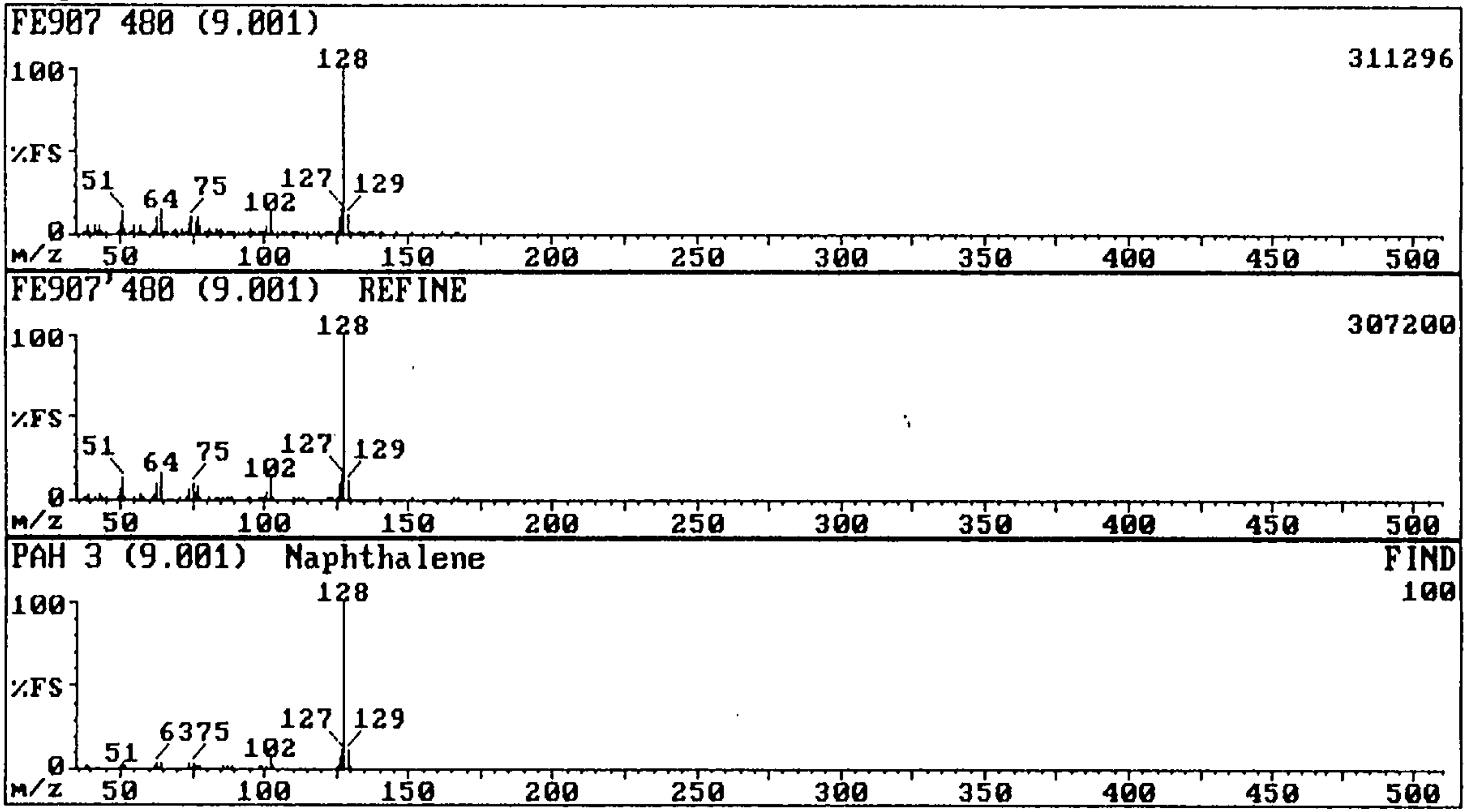


QUAN DB : FE907 - LAB-BASE QUAN 25-Sep-91 16:3

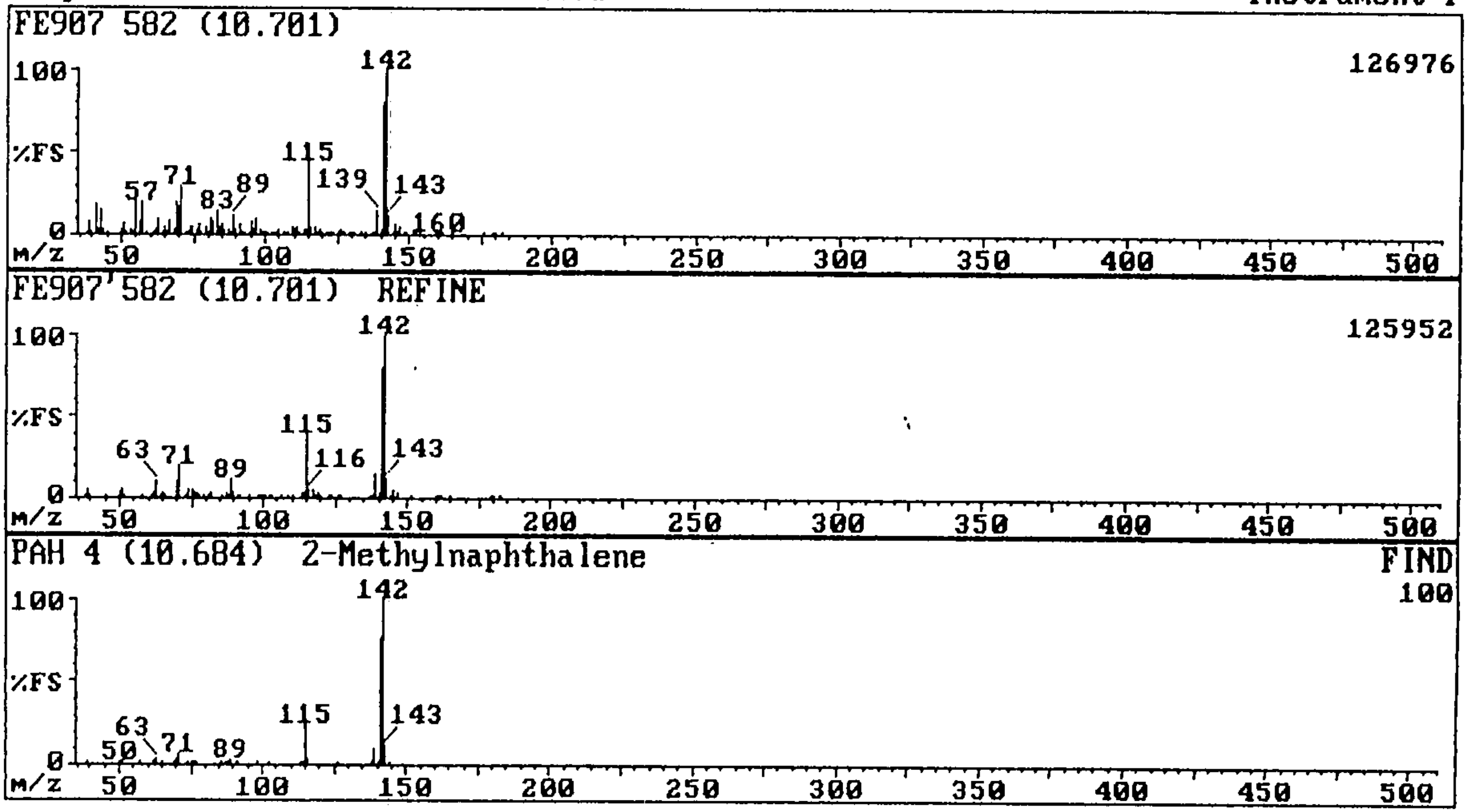
	MAT	FOR	REV	Delta	Area	P.Flags	Scan	QM	Name
1	100	63	99	0	143280	bb	302	152	1,4 Dichlorobenzene-d4
2	76	44	87	1	509210	bb	478	136	Naphthalene-d8
3	97	73	94	-1	915800	bv	480	128	Naphthalene
4	93	59	89	0	334550	vb	582	142	2-Methylnaphthalene
5	86	47	91	0	358310	bv	729	164	Acenaphthene-d10
6	0	0	0	0	0		0	162	2-Chloronaphthalene
7	91	51	95	0	351850	vv	707	152	Acenaphthylene
8	0	0	0	0	0		0	153	Acenaphthene
9	63	30	79	-1	92083	vv	808	166	Fluorene
10	100	65	96	0	711650	vv	941	188	Phenanthrene-d10
11	64	27	93	-2	119540	vv	943	178	Phenanthrene
12	0	0	0	0	0		0	178	Anthracene
13	36	10	64	-3	19276	bb	1113	202	Fluoranthene
14	85	60	93	-3	1195300	bb	1326	240	Chrysene-d12
15	88	67	97	2	460160	bb	1186	244	Terphenyl-d14
16	53	12	72	0	20016	bb	1143	202	Pyrene
17	0	0	0	0	0		0	228	Benzo(a)anthracene
18	0	0	0	0	0		0	228	Chrysene
19	91	78	92	2	1368700	bv	1541	264	Perylene-d12
20	0	0	0	0	0		0	252	Benzo(b)fluoranthene
21	0	0	0	0	0		0	252	Benzo(k)fluoranthene
22	0	0	0	0	0		0	252	Benzo(e)pyrene
23	0	0	0	0	0		0	252	Benzo(a)pyrene
24	0	0	0	0	0		0	252	Perylene
25	0	0	0	0	0		0	276	Indeno(1,2,3-cd)pyrene
26	0	0	0	0	0		0	278	Dibenz(a,h)anthracene
27	0	0	0	0	0		0	276	Benzo(g,h,i)perylene
28	0	0	0	0	0		0	266	Pentachlorophenol
29	76	44	86	-1	147460	vv	381	82	Nitrobenzene-d5
30	66	38	76	-1	156500	bb	643	172	2-Fluorobiphenyl
31	61	27	86	-2	24812	bb	843	330	2,4,6-Tribromophenol
32	83	44	89	0	98356	bb	273	99	Phenol-d5
33	96	69	96	1	476300	vv	1141	212	Pyrene-d10
34	78	50	96	-2	332670	vb	948	188	Anthracene-d10
35	73	27	89	0	47772	bb	486	240	1,4-Dibromobenzene-d4
36	68	35	74	0	54032	bb	428	185	1,3,5-Trichlorobenzene-d3

25-Sep-91 13:34 Triangle Labs, Inc. (919) 544-5729

Sample:RUN#1 (1:4 DIL.) 18976 Instrument F

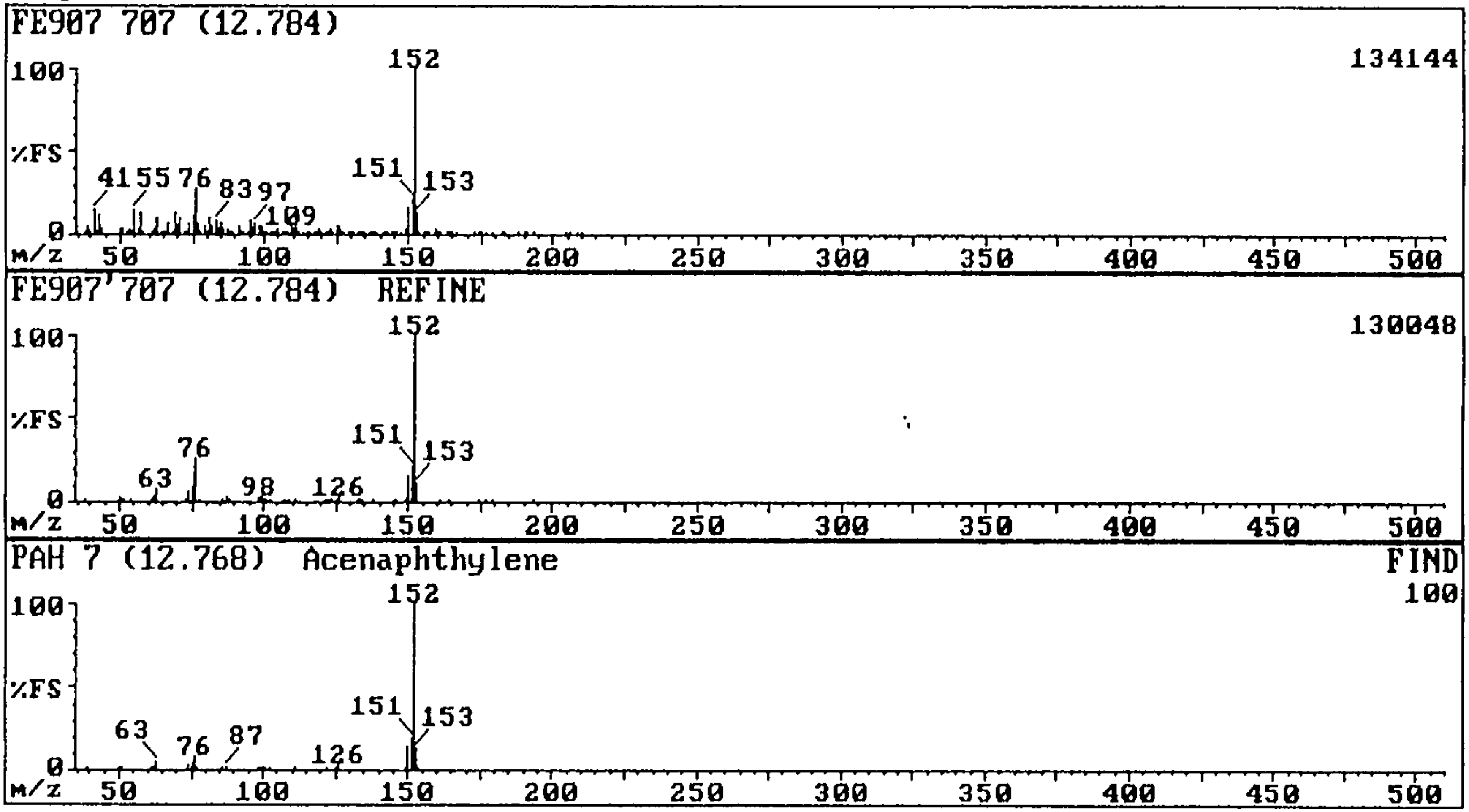


25-Sep-91 13:34 Triangle Labs, Inc. (919) 544-5729
Sample:RUN#1 (1:4 DIL.) 18976 Instrument F

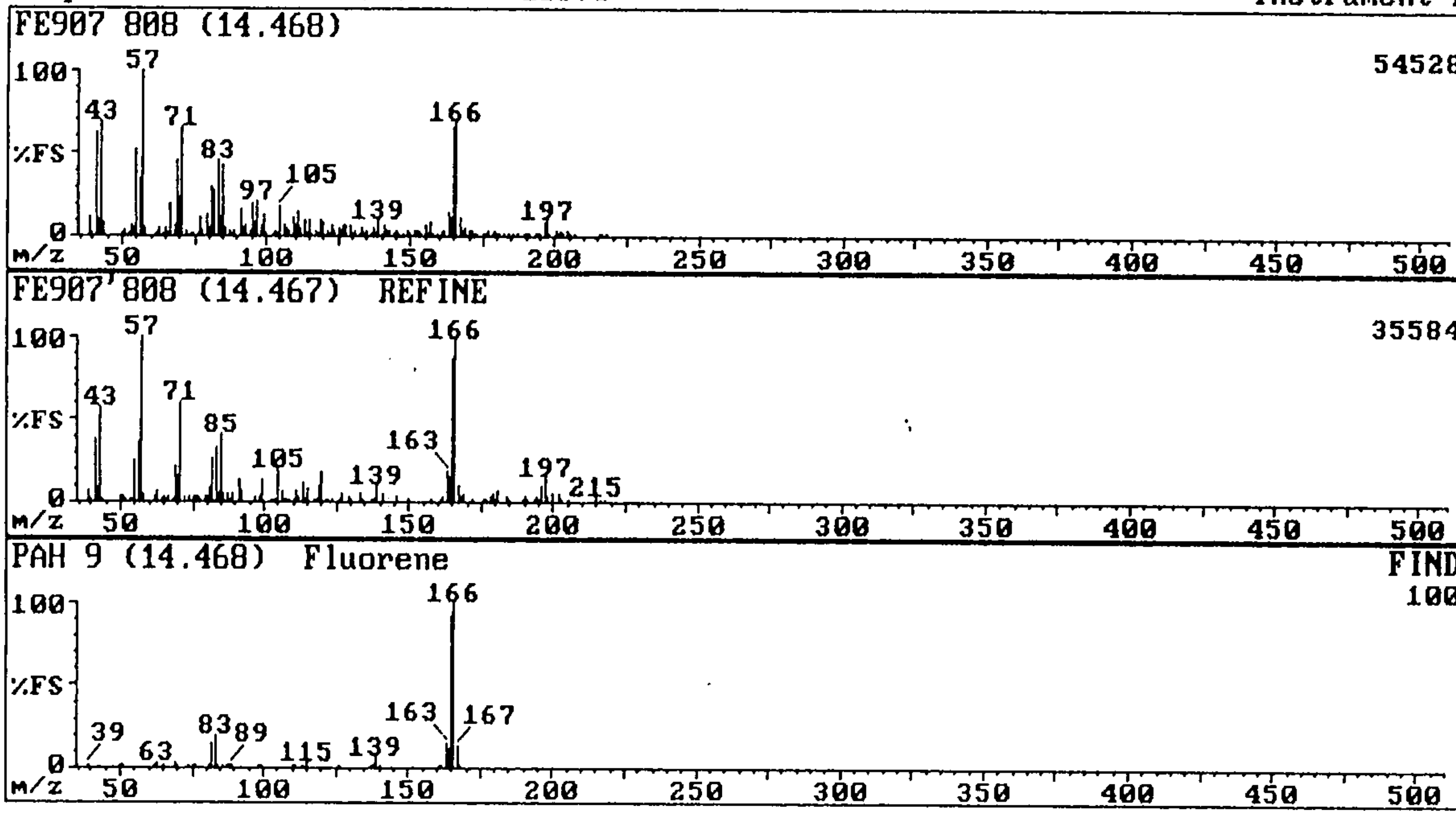


25-Sep-91 13:34 Triangle Labs, Inc. (919) 544-5729

Sample:RUN#1 (1:4 DIL.) 18976 Instrument F

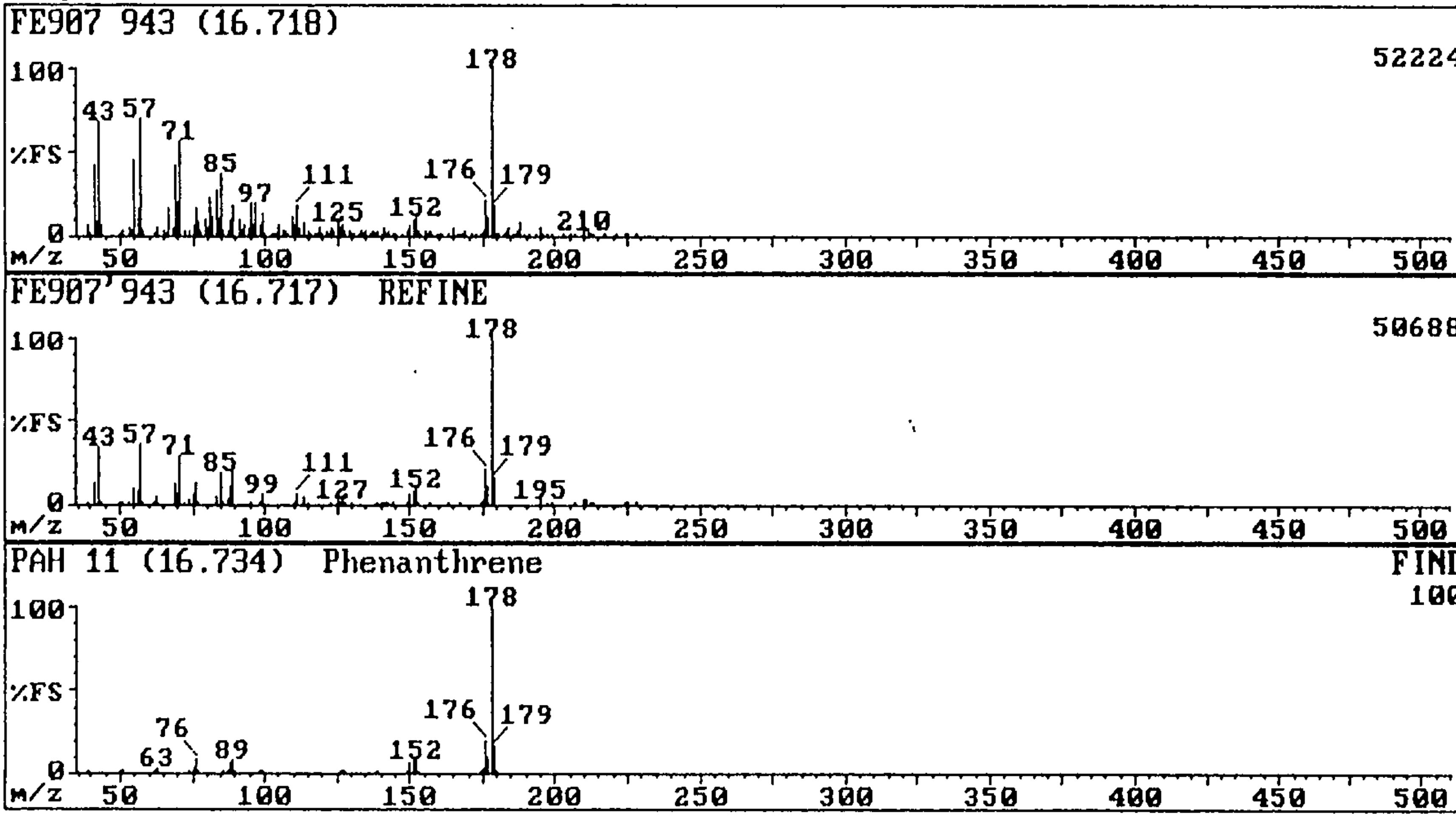


25-Sep-91 13:34 Triangle Labs, Inc. (919) 544-5729
Sample:RUN#1 (1:4 DIL.) 18976 Instrument F



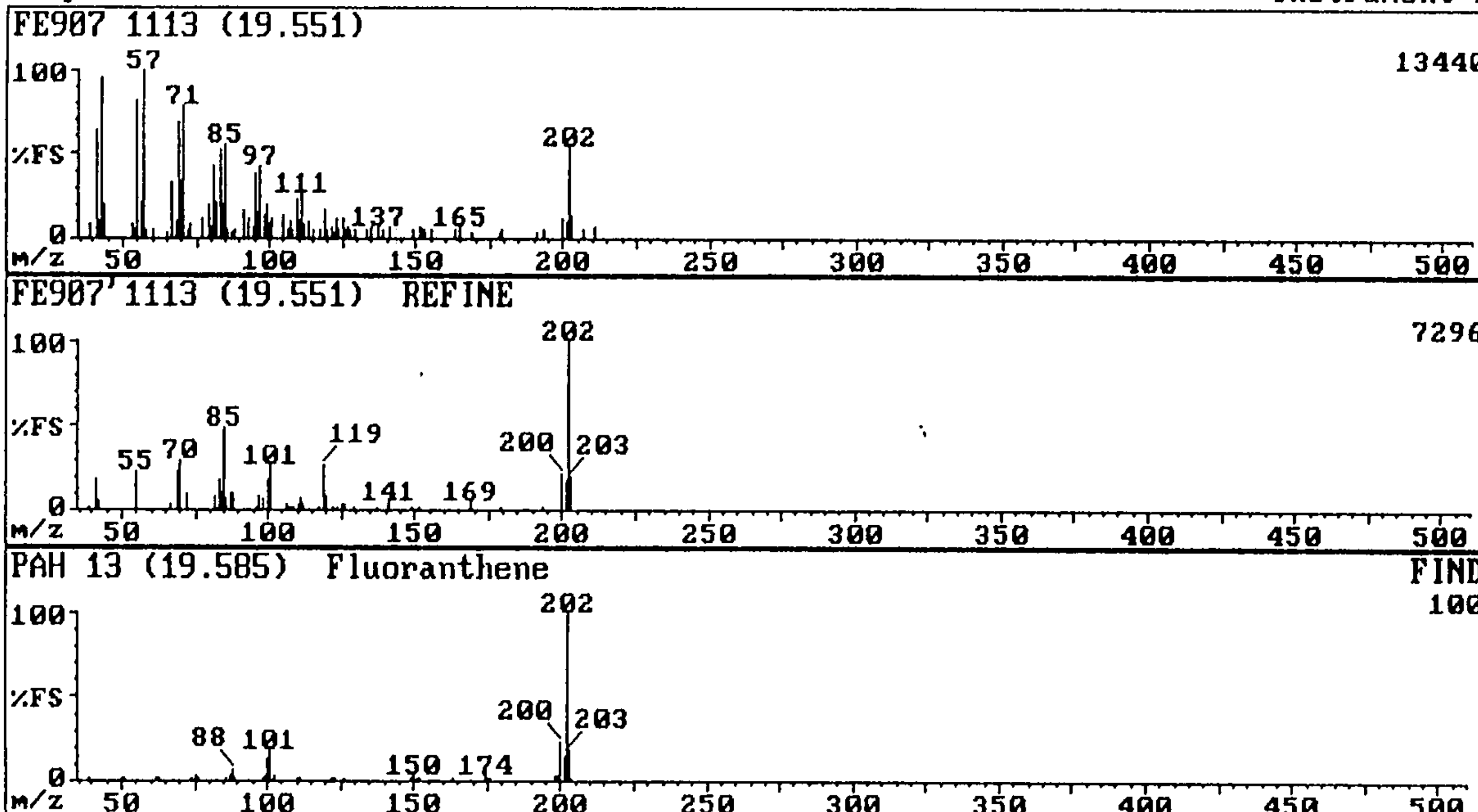
25-Sep-91 13:34 Triangle Labs, Inc. (919) 544-5729

Sample:RUN#1 (1:4 DIL.) 18976 Instrument F



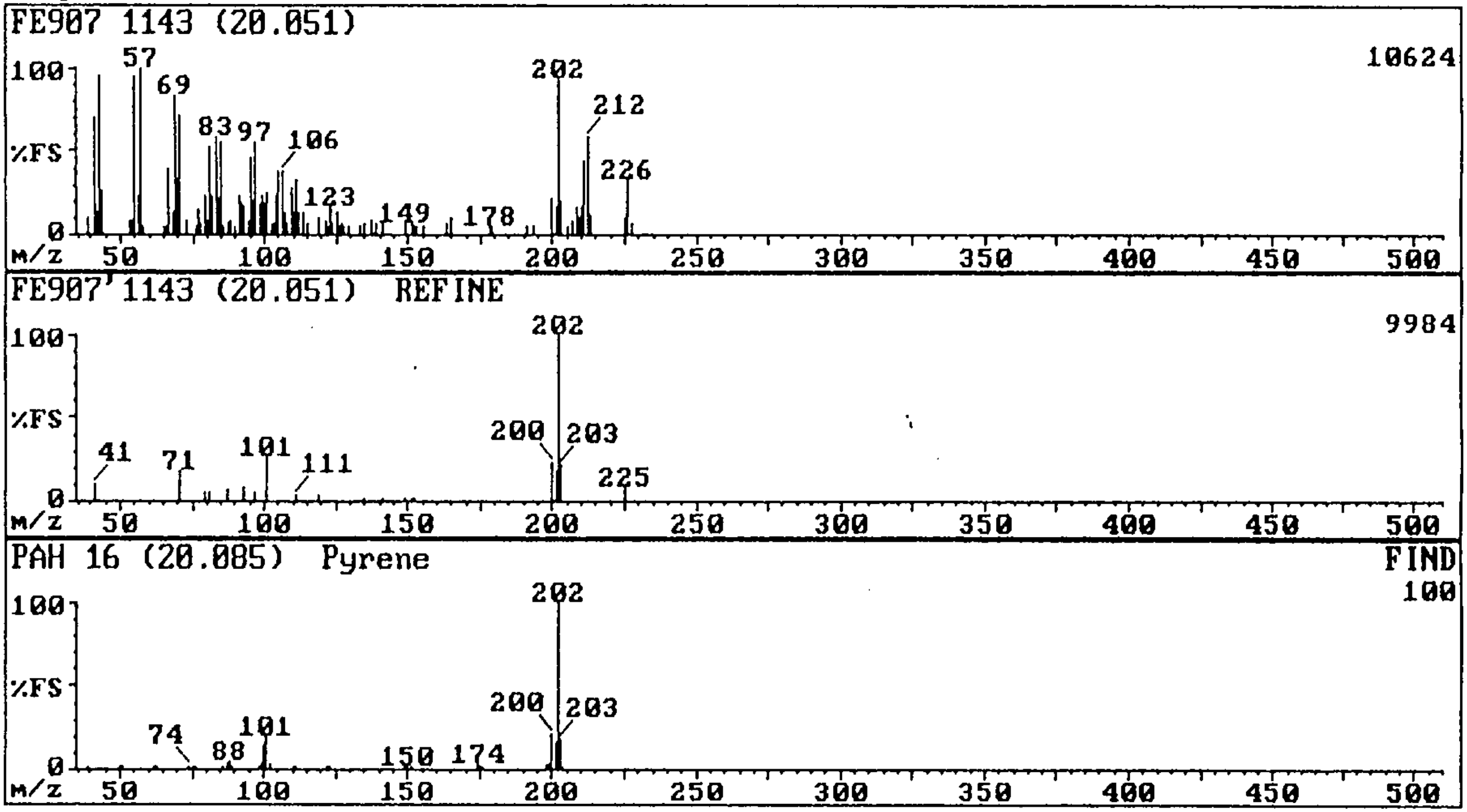
25-Sep-91 13:34 Triangle Labs, Inc. (919) 544-5729

Sample:RUN#1 (1:4 DIL.) 18976 Instrument F



25-Sep-91 13:34 Triangle Labs, Inc. (919) 544-5729

Sample:RUN#1 (1:4 DIL.) 18976 Instrument F



TRIANGLE LABORATORIES, INC.
801 Capitola Drive
Durham, NC 27713
Telephone: (919) 544-5729

DATA FILE:FE816
RF FILE: FE807
DATE: 09/30/91
TLI Project Number: 18976
ANALYSIS DATE: 09/19/91

SAMPLE ID: RUN #2
DILN FACTOR: 1
TLI Sample ID: 46.061.1A.H

QUANTITATION REPORT

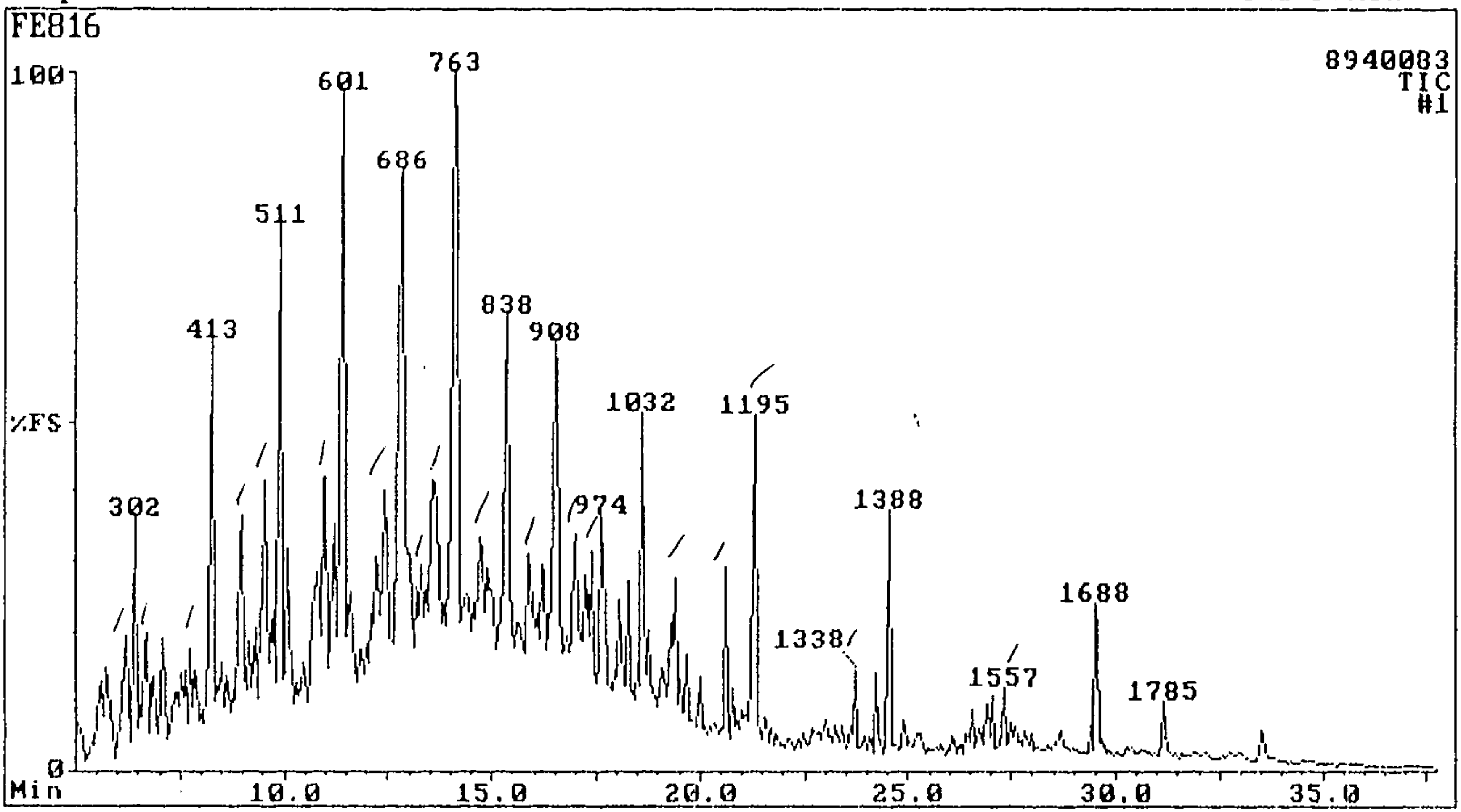
NAME	AREA	RF	SCAN	ISID	AMOUNT, ug	CODE	QUAN LIMIT
1,4-Dichlorobenzene-d4	2044		308	1		IS	
Naphthalene-d8	8050		483	14		IS	
Naphthalene	47772	.9104	487	14	260.75	D	10
2-Methylnaphthalene	17901	.7186	588	14	123.78	D	10
Acenaphthene-d10	5550		736	28		IS	
2-Chloronaphthalene	0	.9327	0	28	.15	ND	10
Acenaphthylene	18268	1.5120	714	28	87.07	D	10
Acenaphthene	0	1.0072	0	28	.14	ND	10
Fluorene	5627	.9405	816	28	43.12	D	10
Phenanthrene-d10	9611		950	47		IS	
Phenanthrene	7006	1.0774	953	47	27.06	D	10
Anthracene	0	1.0176	0	47	.08	ND	10
Fluoranthene	886	1.1700	1123	47	3.15	E	10
Chrysene-d12	8941		1338	57		IS	
Pyrene	0	.9377	0	57	.10	ND	10
Benzo(a)anthracene	0	1.0234	0	57	.09	ND	10
Chrysene	0	1.0396	0	57	.09	ND	10
Perylene-d12	8628		1557	64		IS	
Benzo(b)fluoranthene	0	.8831	0	64	.10	ND	10
Benzo(k)fluoranthene	0	.9783	0	64	.09	ND	10
Benzo(e)pyrene	0	.8487	0	64	.11	ND	10
Benzo(a)pyrene	0	.9448	0	64	.10	ND	10
Perylene	0	.5627	0	64	.16	ND	10
Indeno(1,2,3-cd)pyrene	0	.8595	0	64	.11	ND	10
Dibenz(a,h)anthracene	0	.9225	0	64	.10	ND	10
Benzo(g,h,i)perylene	0	.9620	0	64	.10	ND	10

SURROGATE SUMMARY	AREA	RF	SCAN	ISID	AMOUNT	CODE	% RECOVERY
Terphenyl-d14	18824	.6288	1195	57	133.92	D	133.9
Anthracene-d10	17266	.9242	958	47	77.75	D	77.8
Pyrene-d10	20033	.6547	1152	57	136.89	D	136.9
Phenol-d5	4344	1.1959	282	1	71.10	D	71.1
2,4,6-Tribromophenol	2133	.0779	852	28	197.30	D	197.3
1,4-Dibromobenzene-d4	2593	.4698	491	1	108.04	D	108.0

CODES: ND = Not Detected; D = Detected; E = Estimated; IS = Internal Standard

19-Sep-91 19:24 Triangle Labs, Inc. (919) 544-5729

Sample:RUN#2 18976 Instrument F



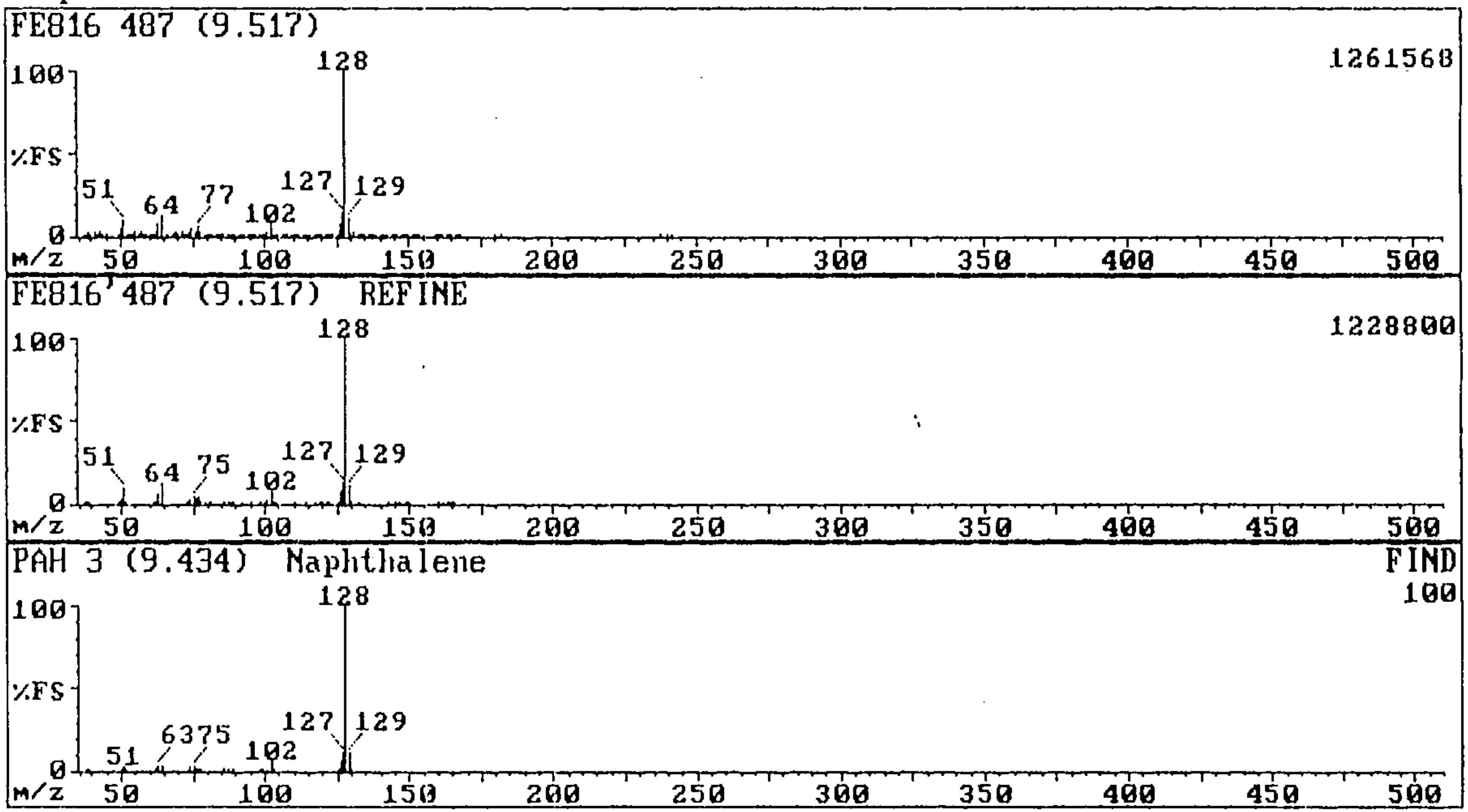
Date Review 9/30/91 SC

QUAN DB : FE816 LAB-BASE QUAN 19-Sep-91 22:58

N	MAT	FOR	REV	Delta	Area	P.Flags	Scan	QM	Name
1	57	38	89	4	204360	bb	308	152	1,4 Dichlorobenzene-d4
2	54	28	81	-3	804960	vv	483	136	Naphthalene-d8
3	93	76	97	2	4777200	bv	487	128	Naphthalene
4	91	56	89	0	1790100	vv	588	142	2-Methylnaphthalene
5	68	27	81	0	555010	vv	736	164	Acenaphthene-d10
6	0	0	0	0	0		0	162	2-Chloronaphthalene
7	90	47	97	0	1826800	bv	714	152	Acenaphthylene
8	0	0	0	0	0		0	153	Acenaphthene
9	73	33	83	0	562670	vv	816	166	Fluorene
10	76	29	92	0	961120	vv	950	188	Phenanthrene-d10
11	78	29	95	0	700550	vv	953	178	Phenanthrene
12	49	10	75	-1	SC ~~66702~~	vv	~~960~~	178	Anthracene
13	47	20	84	-4	88553	vv	1123	202	Fluoranthene
14	56	62	94	-6	894120	bb	1338	240	Chrysene-d12
15	74	42	96	2	1882400	vb	1195	244	Terphenyl-d14
16	59	19	99	2	SC ~~91795~~	vv	~~1154~~	202	Pyrene
17	0	0	0	0	0		0	228	Benzo(a)anthracene
18	0	0	0	0	0		0	228	Chrysene
19	89	61	93	1	862810	bb	1557	264	Perylene-d12
20	0	0	0	0	0		0	252	Benzo(b)fluoranthene
21	0	0	0	0	0		0	252	Benzo(k)fluoranthene
22	0	0	0	0	0		0	252	Benzo(e)pyrene
23	0	0	0	0	0		0	252	Benzo(a)pyrene
[illegible]	0	0	0	0	0		0	252	Perylene
[illegible]	0	0	0	0	0		0	276	Indeno(1,2,3-cd)pyrene
26	0	0	0	0	0		0	278	Dibenz(a,h)anthracene
27	0	0	0	0	0		0	276	Benzo(g,h,i)perylene
28	0	0	0	0	0		0	266	Pentachlorophenol
29	70	43	88	2	414800	vv	386	82	Nitrobenzene-d5
30	69	39	79	-1	970360	bv	648	172	2-Fluorobiphenyl
31	67	23	84	0	213260	bb	852	330	2,4,6-Tribromophenol
32	58	41	88	5	434430	vb	282	99	Phenol-d5
33	81	67	97	3	2003300	vv	1152	212	Pyrene-d10
34	93	52	97	0	1726600	vv	958	188	Anthracene-d10
35	57	23	93	-3	259310	bb	491	240	1,4-Dibromobenzene-d4
36	66	35	79	1	301250	bb	433	185	1,3,5-Trichlorobenzene-d3

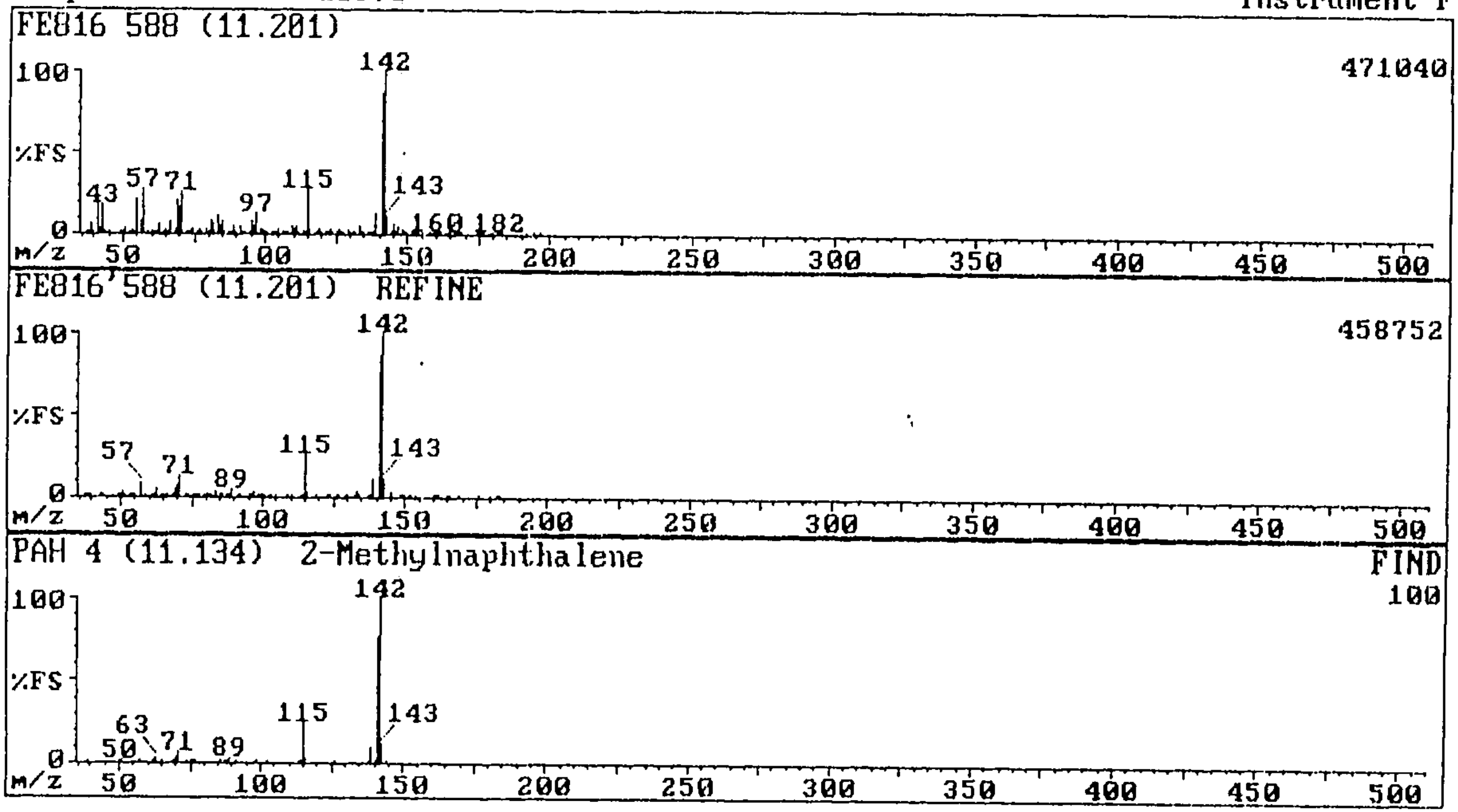
19-Sep-91 19:24 Triangle Labs, Inc. (919) 544-5729

Sample:RUN#2 18976 Instrument F



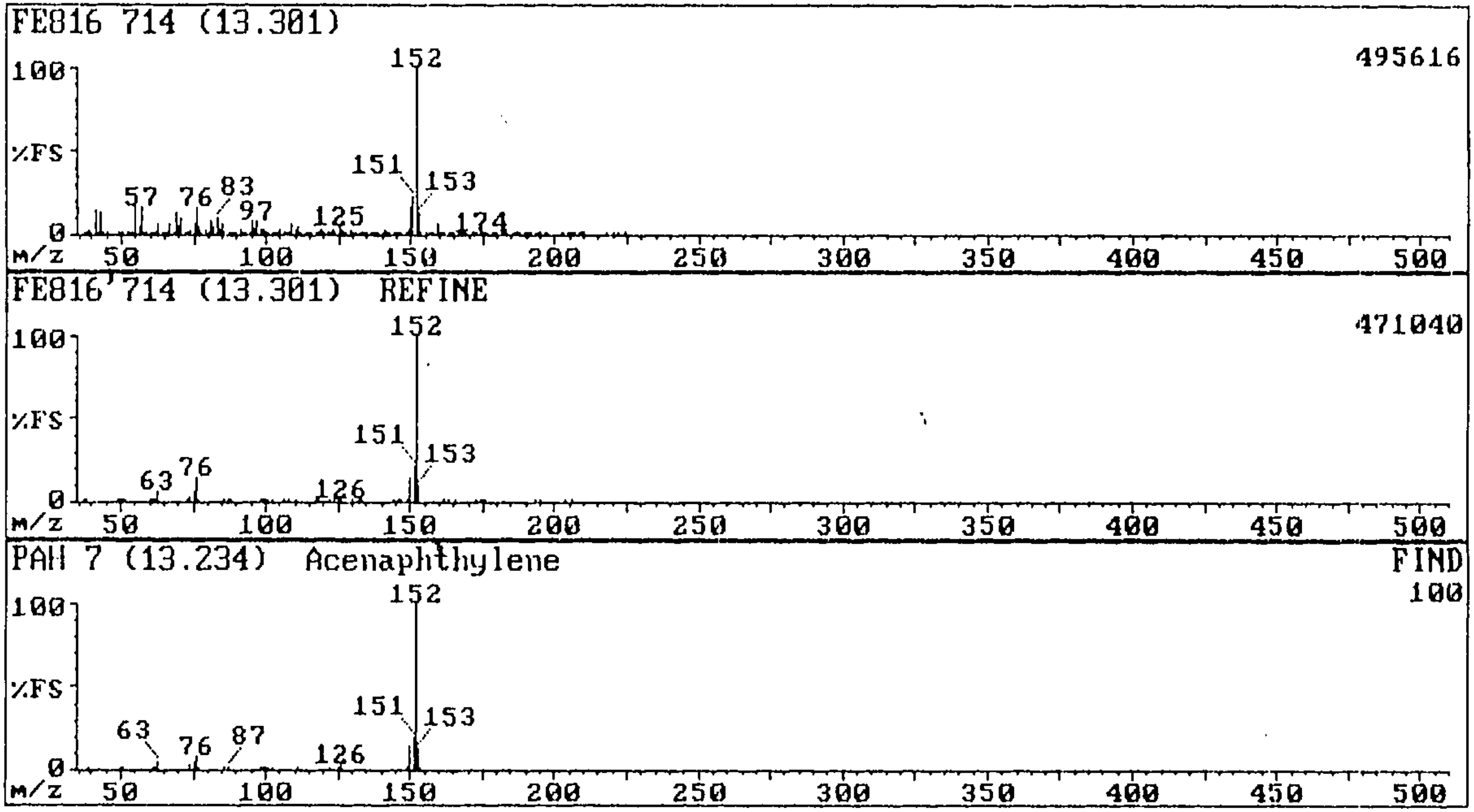
19-Sep-91 19:24 Triangle Labs, Inc. (919) 544-5729

Sample:RUN#2 18976 Instrument F



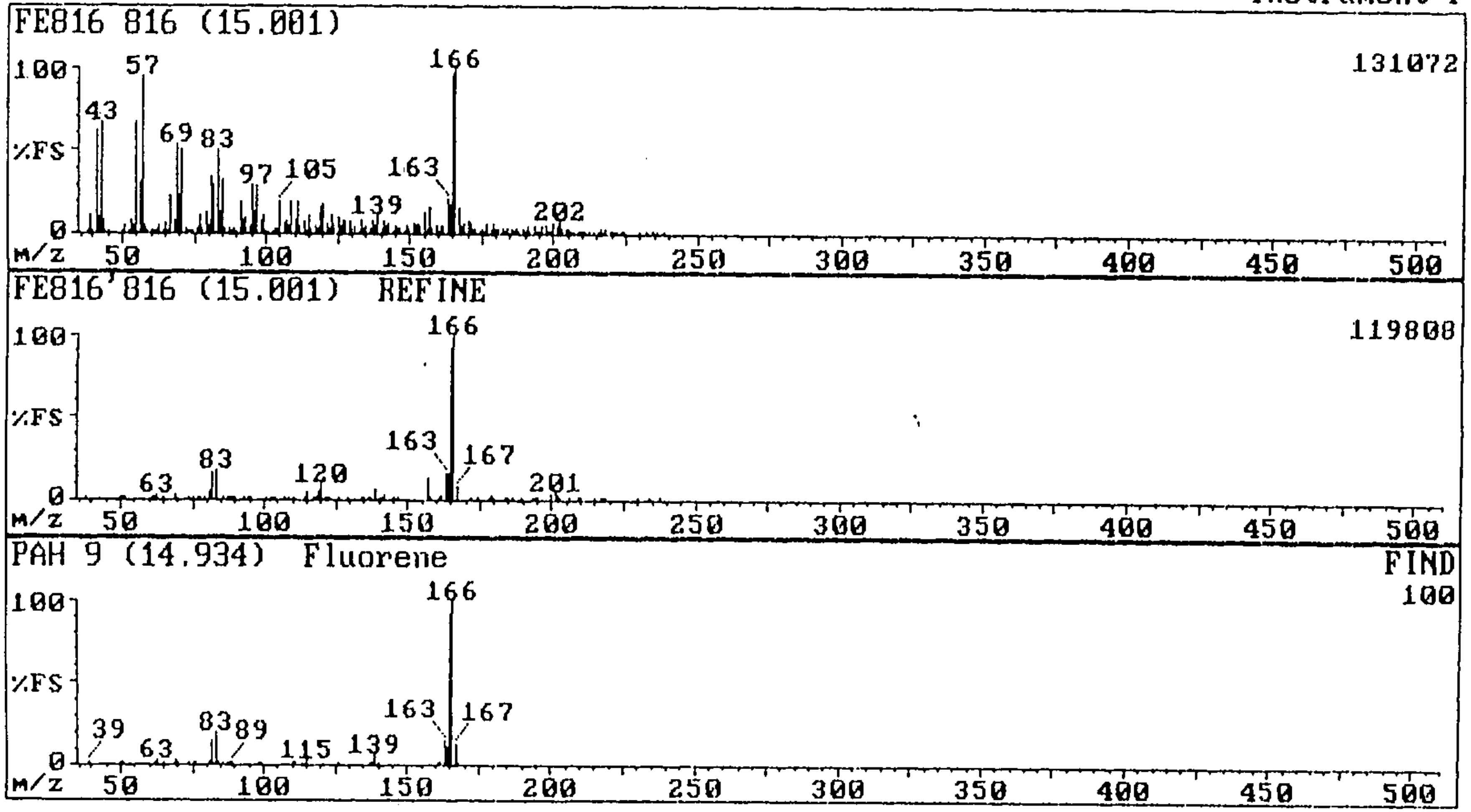
19-Sep-91 19:24 Triangle Labs, Inc. (919) 544-5729

Sample:RUN#2 18976 Instrument F



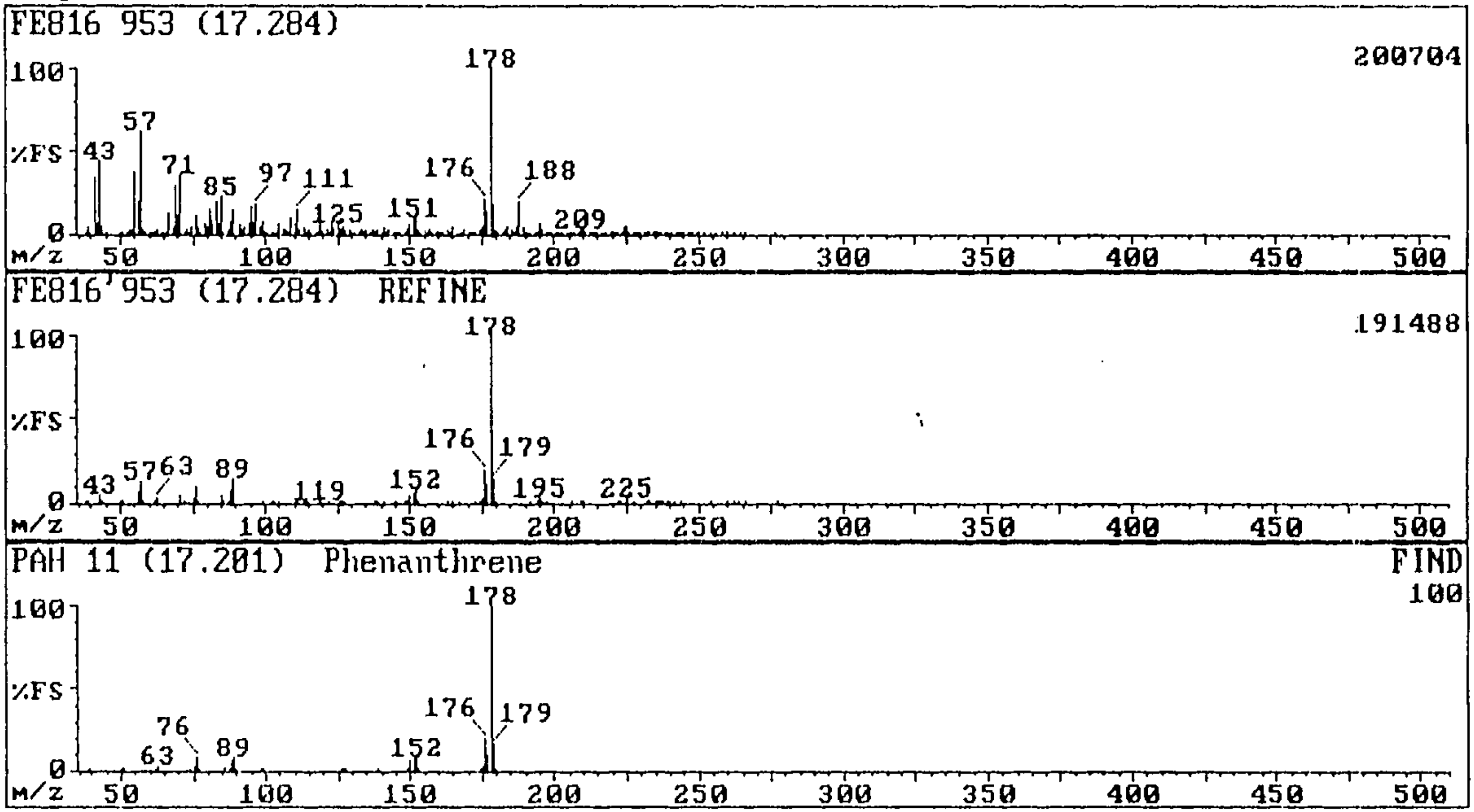
19-Sep-91 19:24 Triangle Labs, Inc. (919) 544-5729

Sample:RUN#2 18976 Instrument F

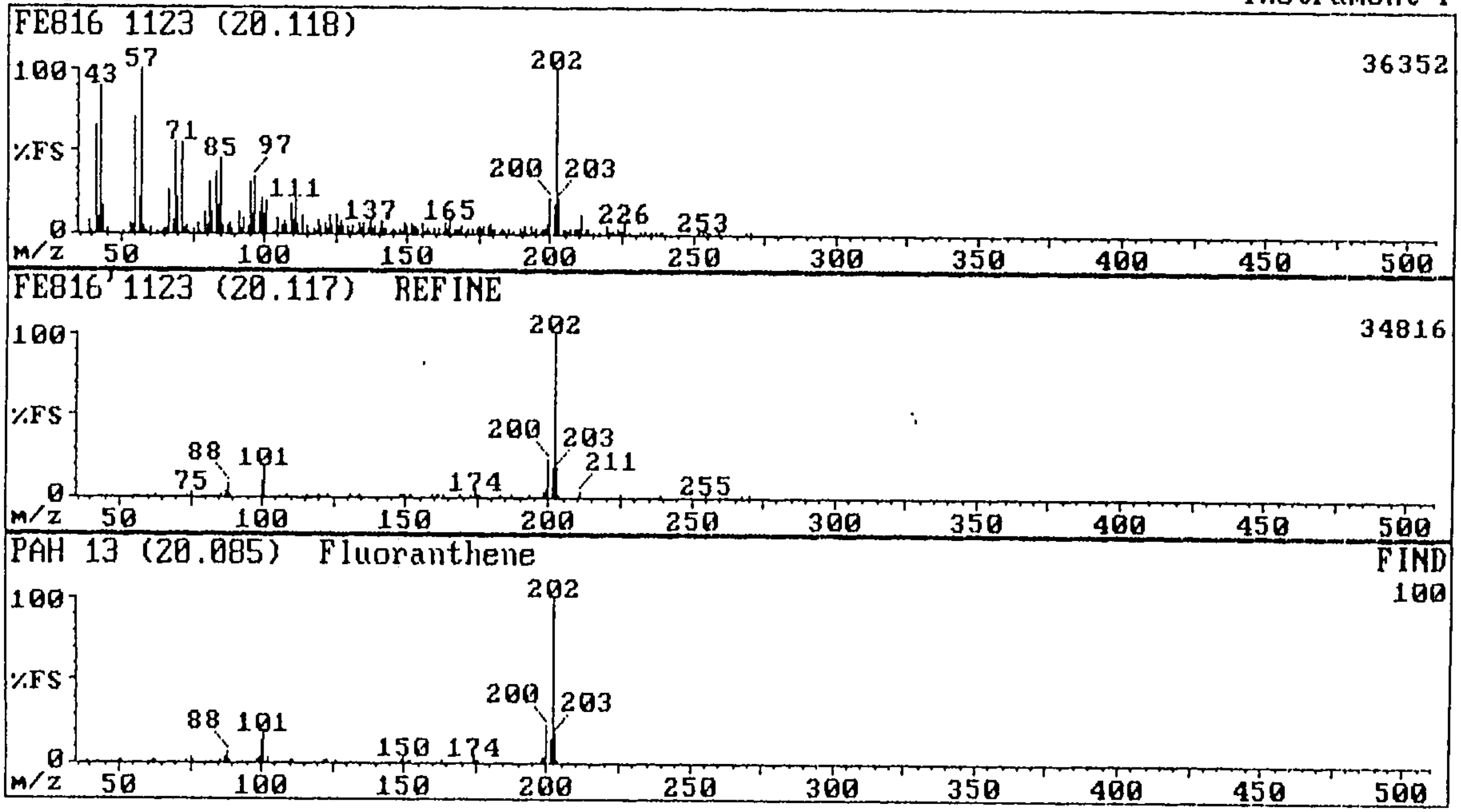


19-Sep-91 19:24 Triangle Labs, Inc. (919) 544-5729

Sample:RUN#2 18976 Instrument F



19-Sep-91 19:24 Triangle Labs, Inc. (919) 544-5729
Sample:RUN#2 18976 Instrument F



TRIANGLE LABORATORIES, INC.
801 Capitola Drive
Durham, NC 27713
Telephone: (919) 544-5729

DATA FILE:FE908
RF FILE: FE901
DATE: 09/30/91
TLI Project Number: 18976
ANALYSIS DATE: 09/25/91

SAMPLE ID: RUN #2 (1:2 dil.)
DILN FACTOR: 2
TLI Sample ID: 46.061.1A.H

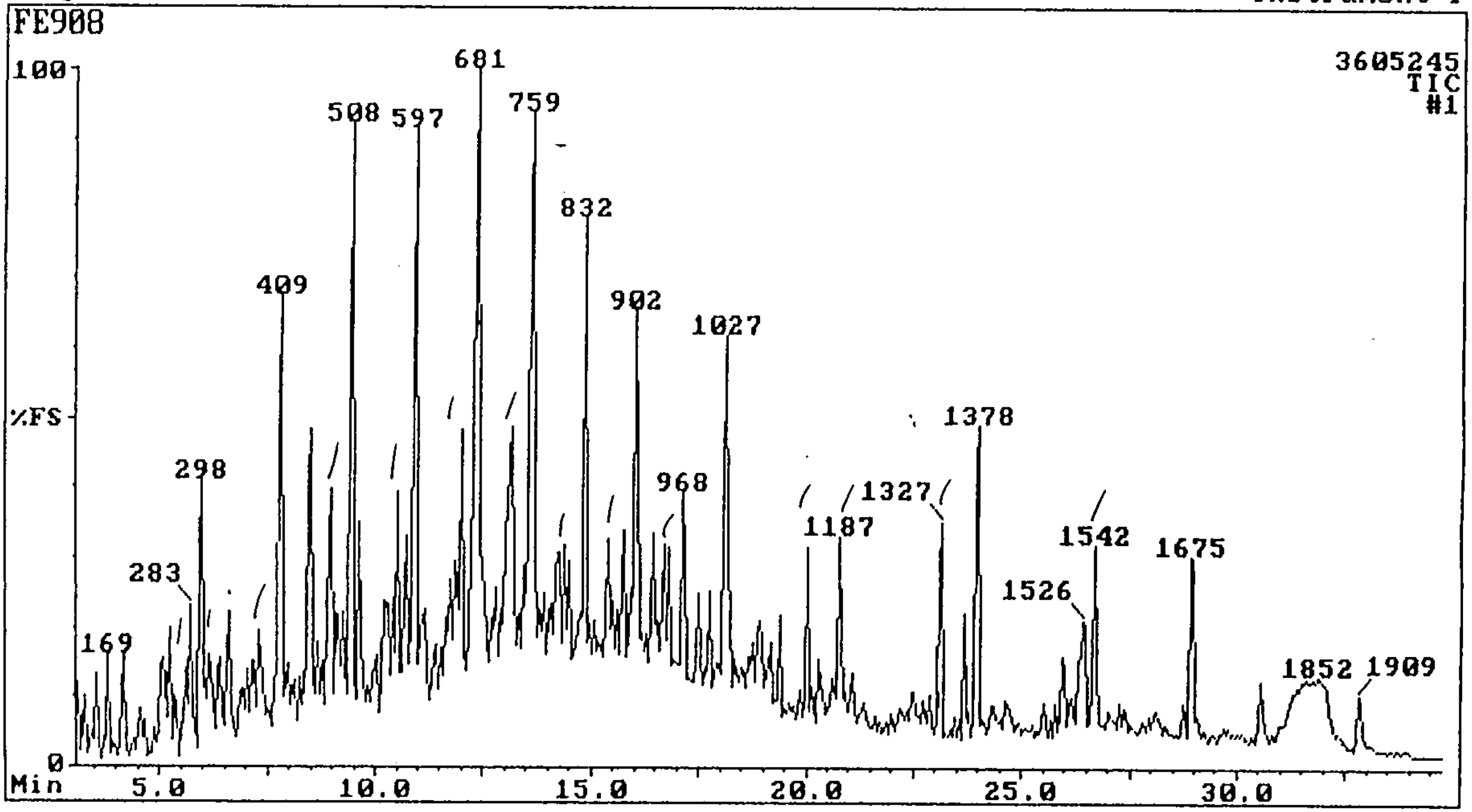
QUANTITATION REPORT

NAME	AREA	RF	SCAN	ISID	AMOUNT, ug	CODE	QUAN LIMIT
1,4-Dichlorobenzene-d4	1122		303	1		IS	
Naphthalene-d8	3940		478	14		IS	
Naphthalene	12301	.9408	481	14	265.44	D	20
2-Methylnaphthalene	4202	.7942	583	14	107.42	D	20
Acenaphthene-d10	2530		729	28		IS	
2-Chloronaphthalene	0	.9237	0	28	.68	ND	20
Acenaphthylene	4618	1.5395	708	28	94.85	D	20
Acenaphthene	0	.9778	0	28	.65	ND	20
Fluorene	1294	1.1415	809	28	35.84	D	20
Phenanthrene-d10	5541		941	47		IS	
Phenanthrene	1929	.8666	944	47	32.13	D	20
Anthracene	0	.8724	0	47	.33	ND	20
Fluoranthene	407	1.3003	1114	47	4.52	E	20
Chrysene-d12	9719		1327	57		IS	
Pyrene	0	1.1620	0	57	.14	ND	20
Benzo(a)anthracene	0	1.0992	0	57	.15	ND	20
Chrysene	0	1.0178	0	57	.16	ND	20
Perylene-d12	11213		1542	64		IS	
Benzo(b)fluoranthene	0	.9739	0	64	.15	ND	20
Benzo(k)fluoranthene	0	1.1928	0	64	.12	ND	20
Benzo(e)pyrene	0	.9749	0	64	.15	ND	20
Benzo(a)pyrene	0	1.0228	0	64	.14	ND	20
Perylene	0	.5802	0	64	.25	ND	20
Indeno(1,2,3-cd)pyrene	0	.8098	0	64	.18	ND	20
Dibenz(a,h)anthracene	0	.8430	0	64	.17	ND	20
Benzo(g,h,i)perylene	0	.9214	0	64	.15	ND	20

SURROGATE SUMMARY	AREA	RF	SCAN	ISID	AMOUNT	CODE	% RECOVERY
Terphenyl-d14	7711	.8179	1186	57	77.60	D	77.6
Anthracene-d10	4937	.8804	949	47	80.97	D	81.0
Pyrene-d10	7396	.8714	1142	57	69.86	D	69.9
Phenol-d5	1689	1.5876	276	1	75.89	D	75.9
2,4,6-Tribromophenol	576	.1108	844	28	164.48	D	164.5
1,4-Dibromobenzene-d4	770	.6186	486	1	88.82	D	88.8

CODES: ND = Not Detected; D = Detected; E = Estimated; IS = Internal Standard

25-Sep-91 14:11 Triangle Labs, Inc. (919) 544-5729
Sample:RUN#2 (1:2 DIL.) 18976 Instrument F

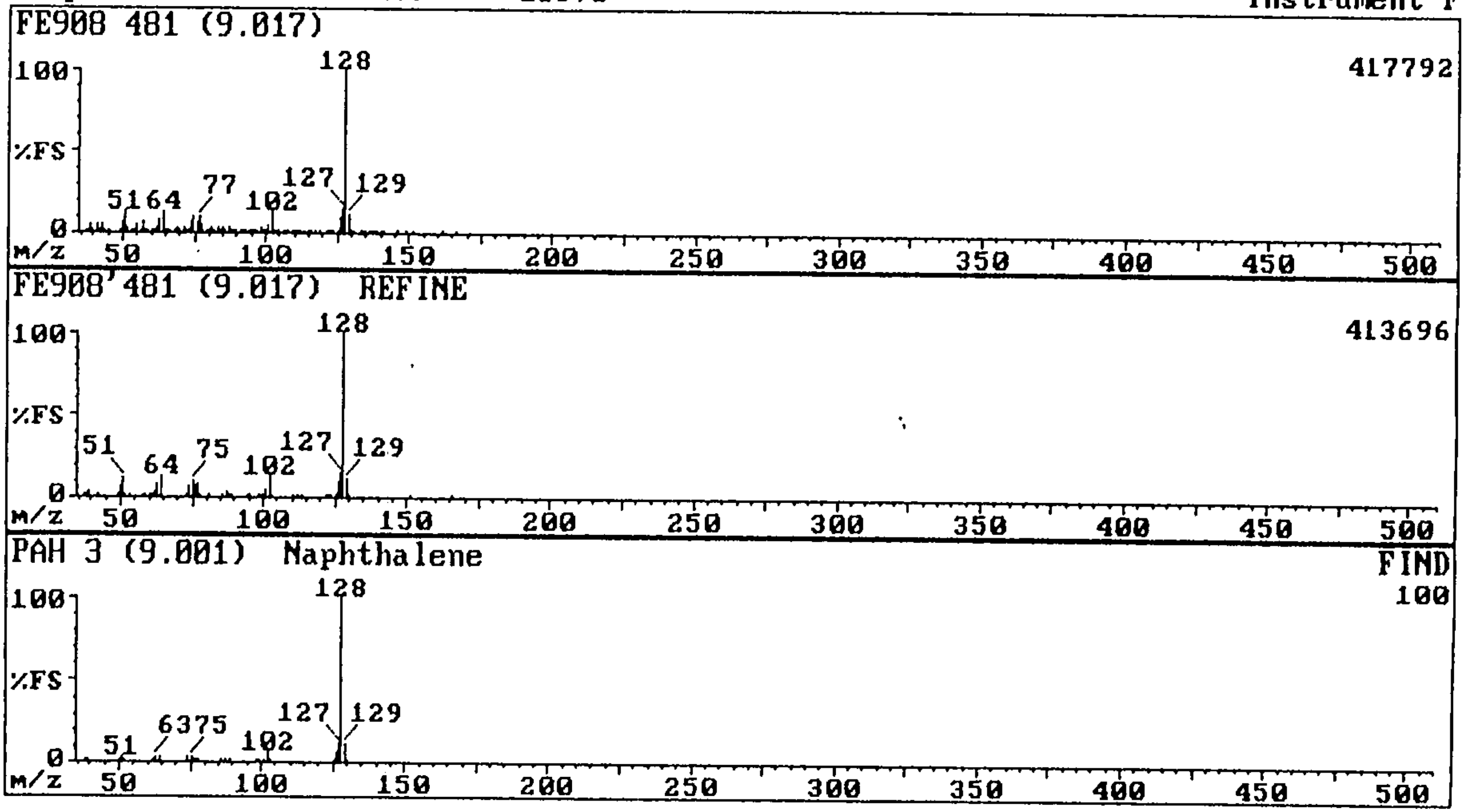


QUAN DB : FE908 LAB-BASE QUAN 25-Sep-91 16:34

N	MAT	FOR	REV	Delta	Area	P.Flags	Scan	QM	Name
1	92	60	98	1	112180	bb	303	152	1.4 Dichlorobenzene-d4
2	71	32	82	0	394040	bb	478	136	Naphthalene-d8
3	100	72	94	0	1230100	vv	481	128	Naphthalene
4	84	57	87	1	420200	vb	583	142	2-Methylnaphthalene
5	73	32	84	0	253010	vv	729	164	Acenaphthene-d10
6	0	0	0	0	0		0	162	2-Chloronaphthalene
7	81	46	93	1	461800	vv	708	152	Acenaphthylene
8	0	0	0	0	0		0	153	Acenaphthene
9	69	31	79	0	129400	vv	809	166	Fluorene
10	91	51	95	0	554080	vv	941	188	Phenanthrene-d10
11	73	32	94	-1	192870	vv	944	178	Phenanthrene
12	34	32	94	-8	~~192870~~	~~vv~~ [illegible]	~~944~~	178	Anthracene
13	52	17	80	-2	40672	vb	1114	202	Fluoranthene
14	89	73	93	-2	971860	bb	1327	240	Chrysene-d12
15	94	63	98	1	771050	bb	1186	244	Terphenyl-d14
16	66	21	85	0	Sc ~~[illegible]~~	bb	~~[illegible]~~	202	Pyrene
17	0	0	0	0	9/30/91 0		0	228	Benzo(a)anthracene
18	0	0	0	0	0		0	228	Chrysene
19	86	69	92	2	1121300	bb	1542	264	Perylene-d12
20	0	0	0	0	0		0	252	Benzo(b)fluoranthene
21	0	0	0	0	0		0	252	Benzo(k)fluoranthene
22	0	0	0	0	0		0	252	Benzo(e)pyrene
23	0	0	0	0	0		0	252	Benzo(a)pyrene
[illegible]	0	0	0	0	0		0	252	Perylene
25	0	0	0	0	0		0	276	Indeno(1,2,3-cd)pyrene
26	0	0	0	0	0		0	278	Dibenz(a,h)anthracene
27	0	0	0	0	0		0	276	Benzo(g,h,i)perylene
28	0	0	0	0	0		0	266	Pentachlorophenol
29	83	53	90	-1	224800	vv	381	82	Nitrobenzene-d5
30	69	40	78	-1	233240	bb	643	172	2-Fluorobiphenyl
31	70	31	89	-1	57636	bb	844	330	2,4,6-Tribromophenol
32	83	51	92	2	168940	bb	276	99	Phenol-d5
33	97	69	98	1	739580	vv	1142	212	Pyrene-d10
34	85	50	96	-1	493700	vb	949	188	Anthracene-d10
35	67	27	89	-1	77044	bb	486	240	1,4-Dibromobenzene-d4
36	71	37	76	0	76976	bb	428	185	1,3,5-Trichlorobenzene-d3

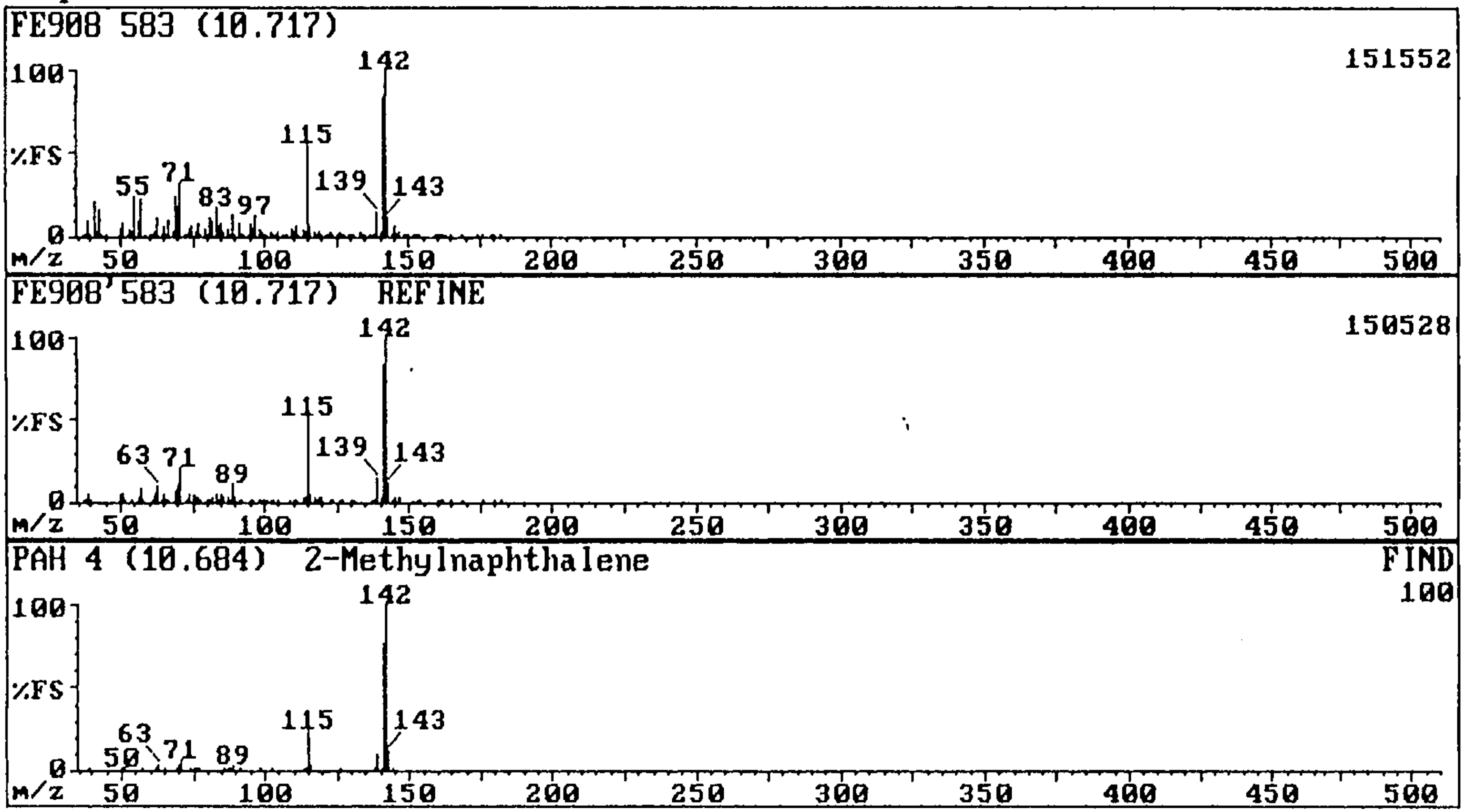
25-Sep-91 14:11 Triangle Labs, Inc. (919) 544-5729

Sample:RUN#2 (1:2 DIL.) 18976 Instrument F



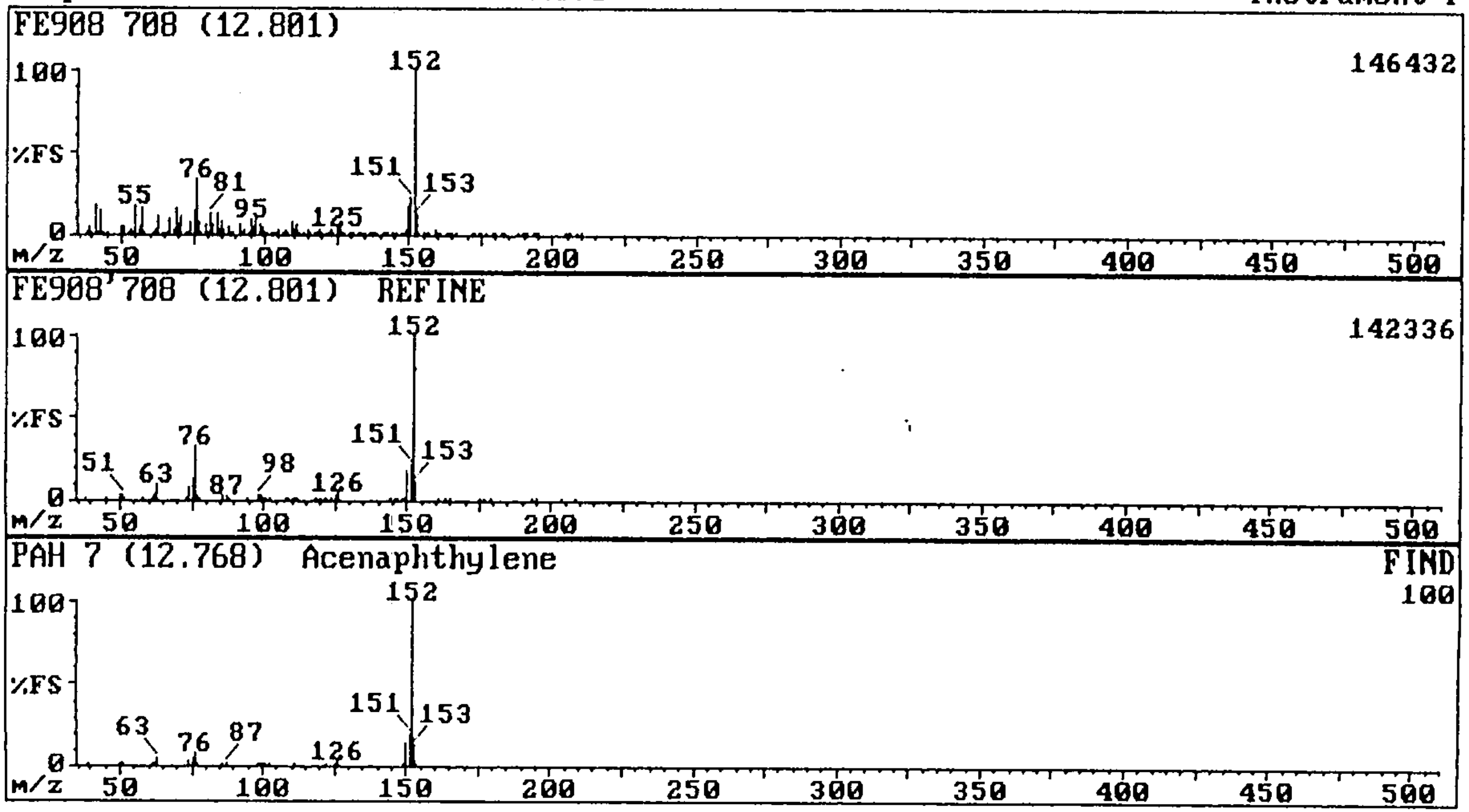
25-Sep-91 14:11 Triangle Labs, Inc. (919) 544-5729

Sample:RUN#2 (1:2 DIL.) 18976 Instrument F

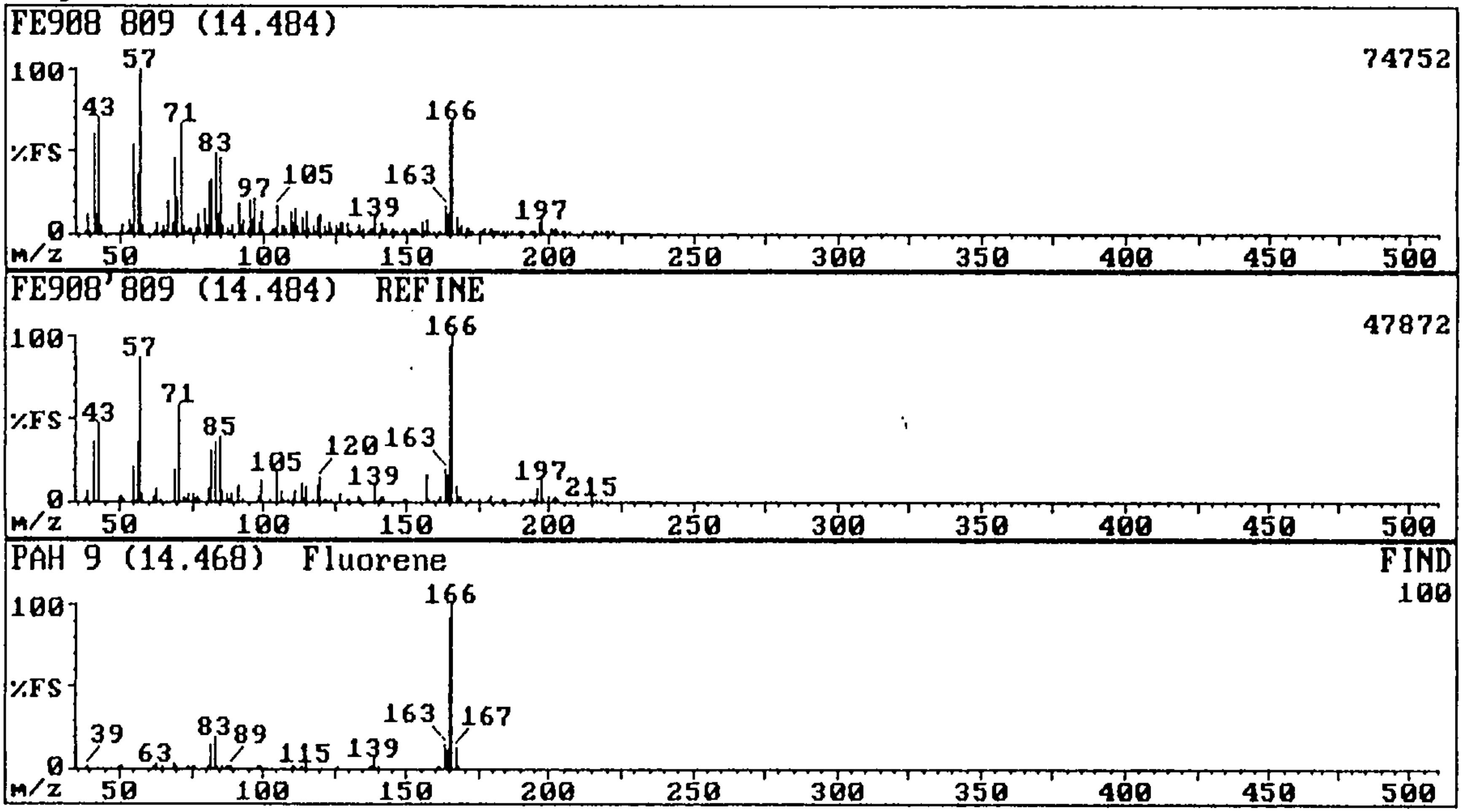


25-Sep-91 14:11 Triangle Labs, Inc. (919) 544-5729

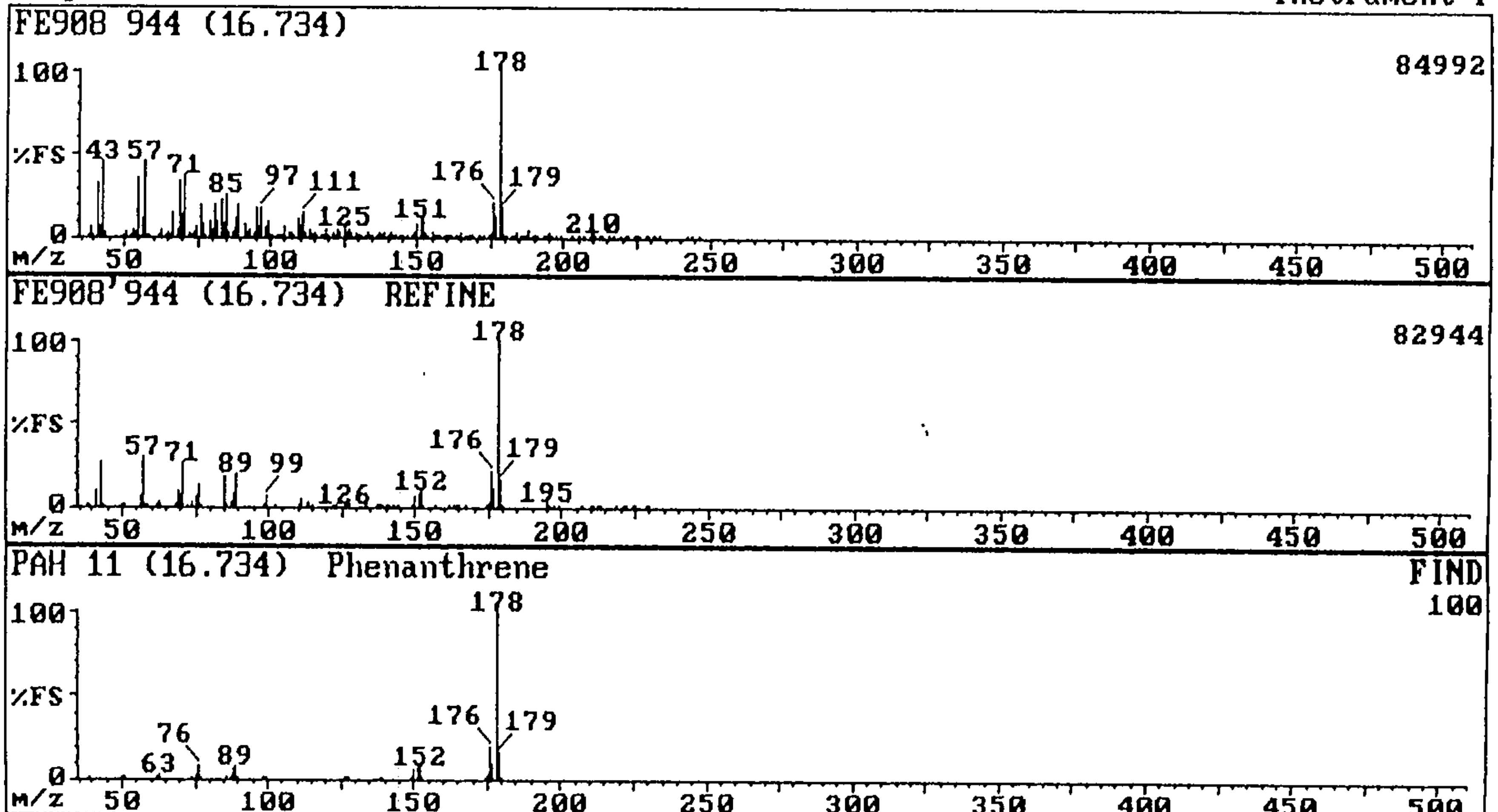
Sample:RUN#2 (1:2 DIL.) 18976 Instrument F



25-Sep-91 14:11 Triangle Labs, Inc. (919) 544-5729
Sample:RUN#2 (1:2 DIL.) 18976 Instrument F

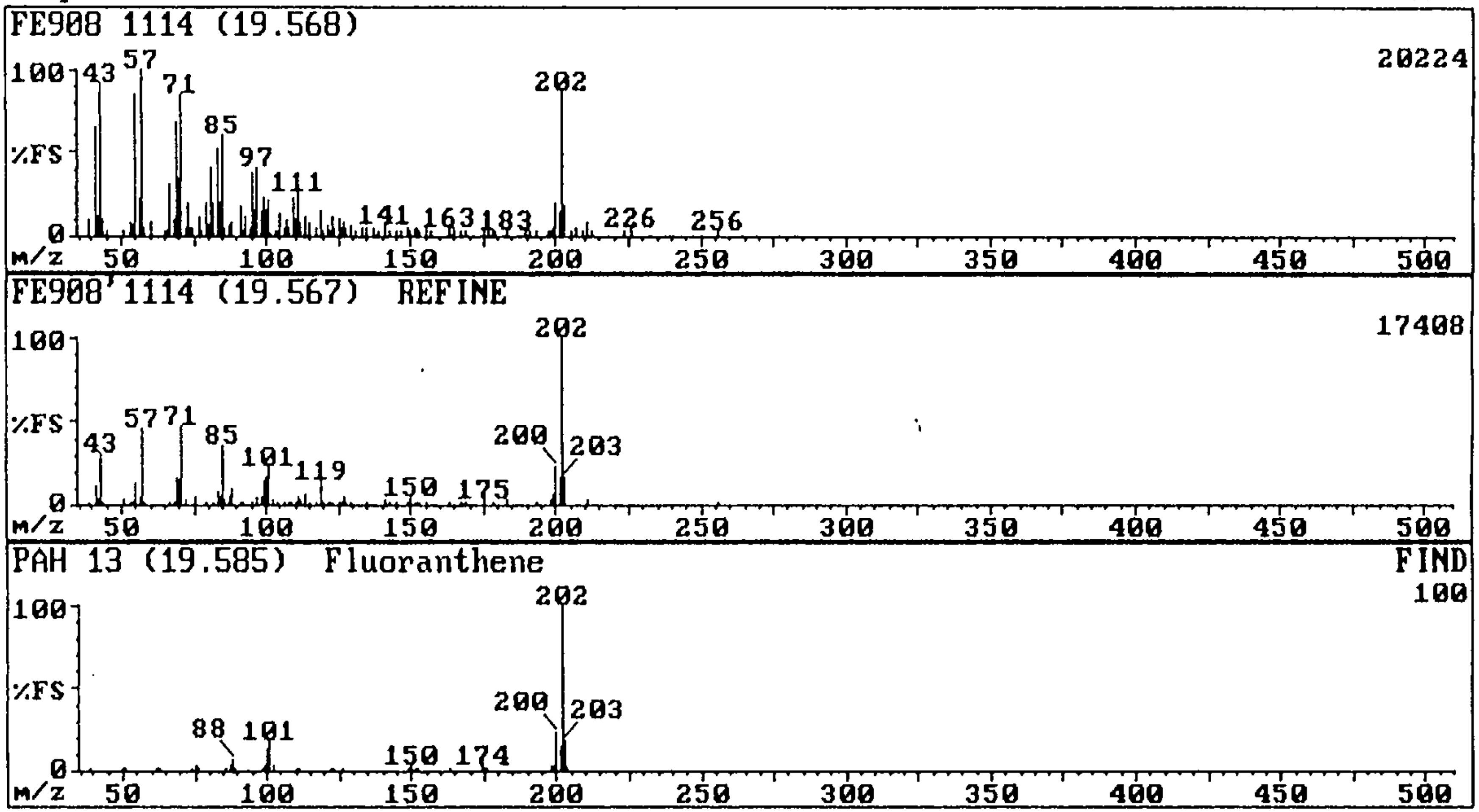


25-Sep-91 14:11 Triangle Labs, Inc. (919) 544-5729
Sample:RUN#2 (1:2 DIL.) 18976 Instrument F



25-Sep-91 14:11 Triangle Labs, Inc. (919) 544-5729

Sample:RUN#2 (1:2 DIL.) 18976 Instrument F



TRIANGLE LABORATORIES, INC.
801 Capitola Drive
Durham, NC 27713
Telephone: (919) 544-5729

DATA FILE:FE817
RF FILE: FE807
DATE: 09/30/91
TLI Project Number: 18976
ANALYSIS DATE: 09/19/91

SAMPLE ID: RUN #3
DILN FACTOR: 1
TLI Sample ID: 46.062.1A.H

QUANTITATION REPORT

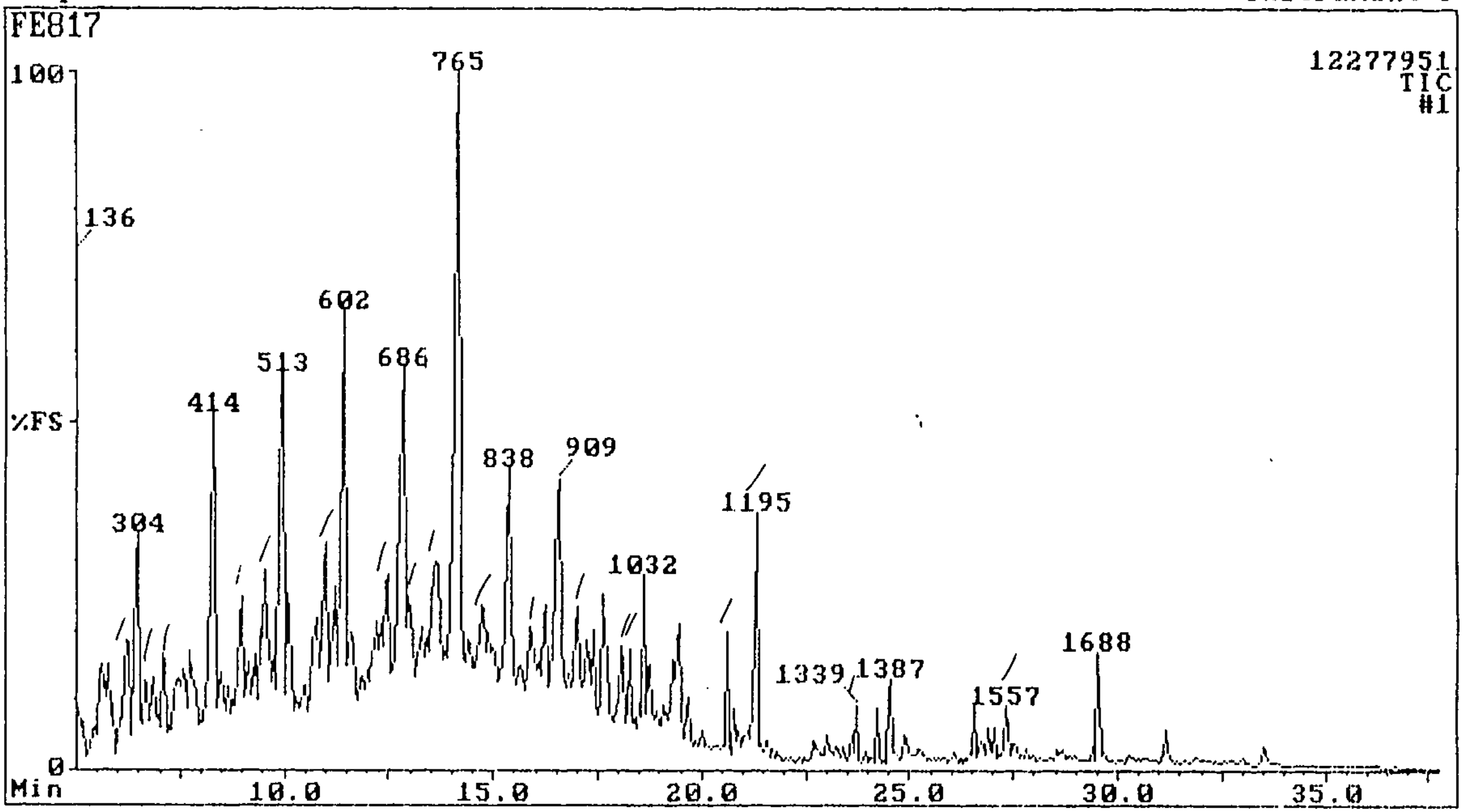
NAME	AREA	RF	SCAN	ISID	AMOUNT, ug	CODE	QUAN LIMIT
1,4-Dichlorobenzene-d4	1894		309	1		IS	
Naphthalene-d8	6598		484	14		IS	
Naphthalene	44416	.9104	487	14	295.77	D	10
2-Methylnaphthalene	16736	.7186	589	14	141.19	D	10
Acenaphthene-d10	4445		736	28		IS	
2-Chloronaphthalene	0	.9327	0	28	.19	ND	10
Acenaphthylene	14530	1.5120	715	28	86.47	D	10
Acenaphthene	0	1.0072	0	28	.18	ND	10
Fluorene	3992	.9405	817	28	38.20	D	10
Phenanthrene-d10	8251		950	47		IS	
Phenanthrene	4531	1.0774	953	47	20.39	D	10
Anthracene	668	1.0176	961	47	3.18	E	10
Fluoranthene	628	1.1700	1123	47	2.60	E	10
Chrysene-d12	9423		1338	57		IS	
Pyrene	0	.9377	0	57	.09	ND	10
Benzo(a)anthracene	0	1.0234	0	57	.08	ND	10
Chrysene	0	1.0396	0	57	.08	ND	10
Perylene-d12	10512		1557	64		IS	
Benzo(b)fluoranthene	0	.8831	0	64	.09	ND	10
Benzo(k)fluoranthene	0	.9783	0	64	.08	ND	10
Benzo(e)pyrene	0	.8487	0	64	.09	ND	10
Benzo(a)pyrene	0	.9448	0	64	.08	ND	10
Perylene	0	.5627	0	64	.14	ND	10
Indeno(1,2,3-cd)pyrene	0	.8595	0	64	.09	ND	10
Dibenz(a,h)anthracene	0	.9225	0	64	.08	ND	10
Benzo(g,h,i)perylene	0	.9620	0	64	.08	ND	10

SURROGATE SUMMARY	AREA	RF	SCAN	ISID	AMOUNT	CODE	% RECOVERY
Terphenyl-d14	19503	.6288	1195	57	131.66	D	131.7
Anthracene-d10	13748	.9242	959	47	72.12	D	72.1
Pyrene-d10	17738	.6547	1152	57	115.00	D	115.0
Phenol-d5	4095	1.1959	282	1	72.33	D	72.3
2,4,6-Tribromophenol	2083	.0779	853	28	240.57	D	240.6
1,4-Dibromobenzene-d4	2707	.4898	492	1	121.69	D	121.7

CODES: ND = Not Detected; D = Detected; E = Estimated; IS = Internal Standard

19-Sep-91 20:11 Triangle Labs, Inc. (919) 544-5729

Sample:RUN#3 18976 Instrument F

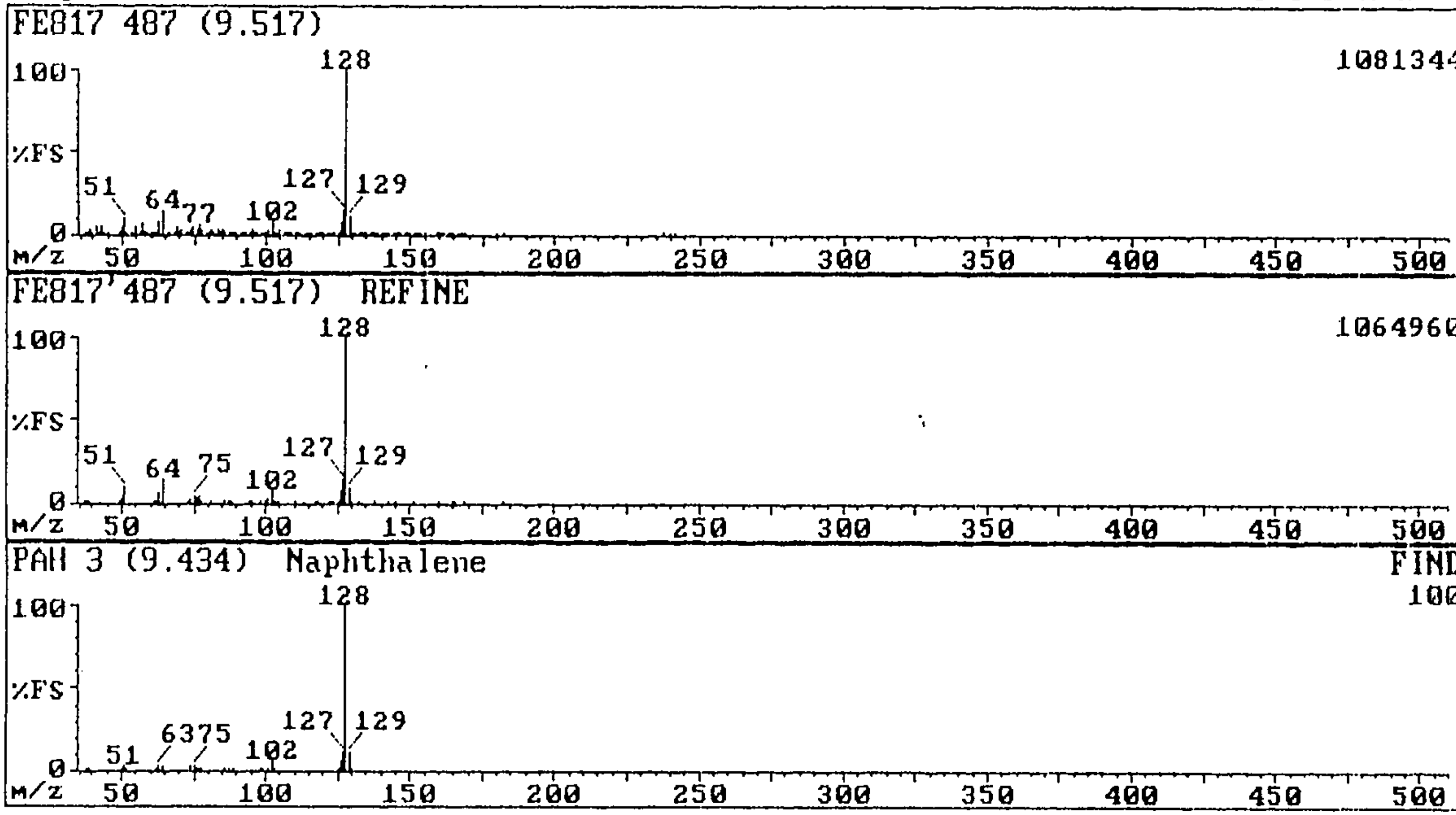


QUAN DB : FE817 LAB-BASE QUAN 19-Sep-91 23:01

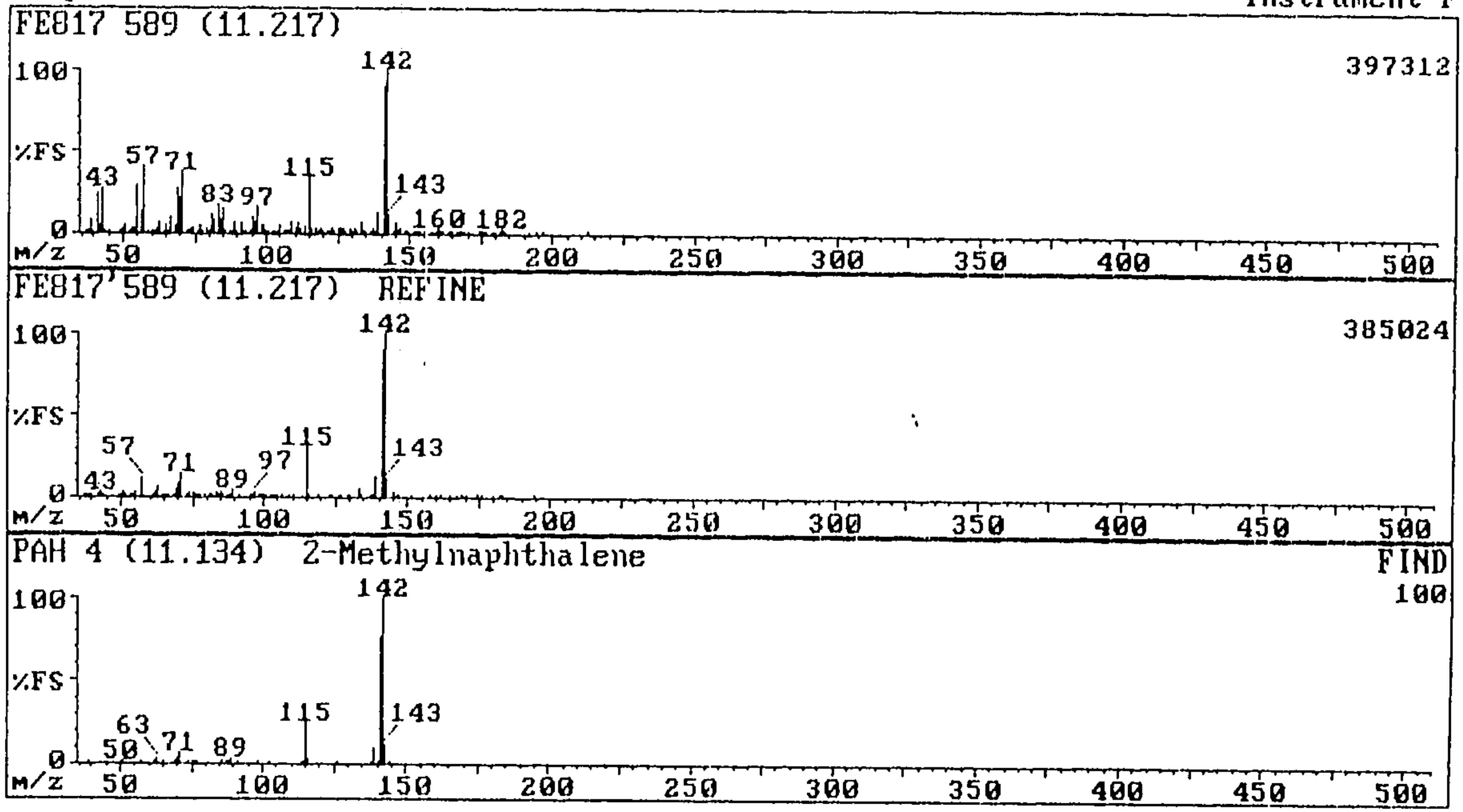
N	MAT	FOR	REV	Delta	Area	P.Flags	Scan	QM	Name
1	47	31	86	5	189380	bv	309	152	1,4 Dichlorobenzene-d4
2	44	21	69	-3	659780	vv	484	136	Naphthalene-d8
3	96	70	96	1	4441600	bv	487	128	Naphthalene
4	84	50	84	0	1673600	vv	589	142	2-Methylnaphthalene
5	52	22	75	-2	444530	bv	736	164	Acenaphthene-d10
6	0	0	0	0	0		0	162	2-Chloronaphthalene
7	79	40	96	1	1453000	vv	715	152	Acenaphthylene
8	0	0	0	0	0		0	153	Acenaphthene
9	63	30	79	1	399220	vv	817	166	Fluorene
10	74	28	90	0	825060	vv	950	188	Phenanthrene-d10
11	67	23	93	0	453060	vv	953	178	Phenanthrene
12	56	11	79	0	66817	vv	961	178	Anthracene
13	42	15	79	-4	62784	vv	1123	202	Fluoranthene
14	58	69	93	-6	942330	bb	1338	240	Chrysene-d12
15	75	43	96	2	1950300	vb	1195	244	Terphenvl-d14
16	57	18	89	2	5c ~~[illegible]~~	bb	~~1154~~	202	Pyrene
17	0	0	0	0	0		0	228	Benzo(a)anthracene
18	0	0	0	0	0		0	228	Chrysene
19	92	67	92	1	1051200	bb	1557	264	Perylene-d12
20	0	0	0	0	0		0	252	Benzo(b)fluoranthene
21	0	0	0	0	0		0	252	Benzo(k)fluoranthene
22	0	0	0	0	0		0	252	Benzo(e)pyrene
23	0	0	0	0	0		0	252	Benzo(a)pyrene
24	0	0	0	0	0		0	252	Perylene
[illegible]	0	0	0	0	0		0	276	Indeno(1,2,3-cd)pyrene
26	0	0	0	0	0		0	278	Dibenz(a,h)anthracene
27	0	0	0	0	0		0	276	Benzo(g,h,i)perylene
28	0	0	0	0	0		0	266	Pentachlorophenol
29	70	38	83	1	443490	vv	386	82	Nitrobenzene-d5
30	63	35	74	-1	867000	bv	648	172	2-Fluorobiphenyl
31	62	22	84	1	208270	bb	853	330	2,4,6-Tribromophenol
32	54	35	85	4	409530	vb	282 ok	99	Phenol-d5
33	81	68	97	3	5c ~~1773000~~	vb	~~1152~~ "	212	Pyrene-d10
34	85	51	96	1	1374800	vv	959 [illegible]	188	Anthracene-d10
35	54	20	90	-3	270660	bb	492	240	1,4-Dibromobenzene-d4
36	58	28	72	1	332290	bb	434	185	1.3.5-Trichlorobenzene-d3

19-Sep-91 20:11 Triangle Labs, Inc. (919) 544-5729

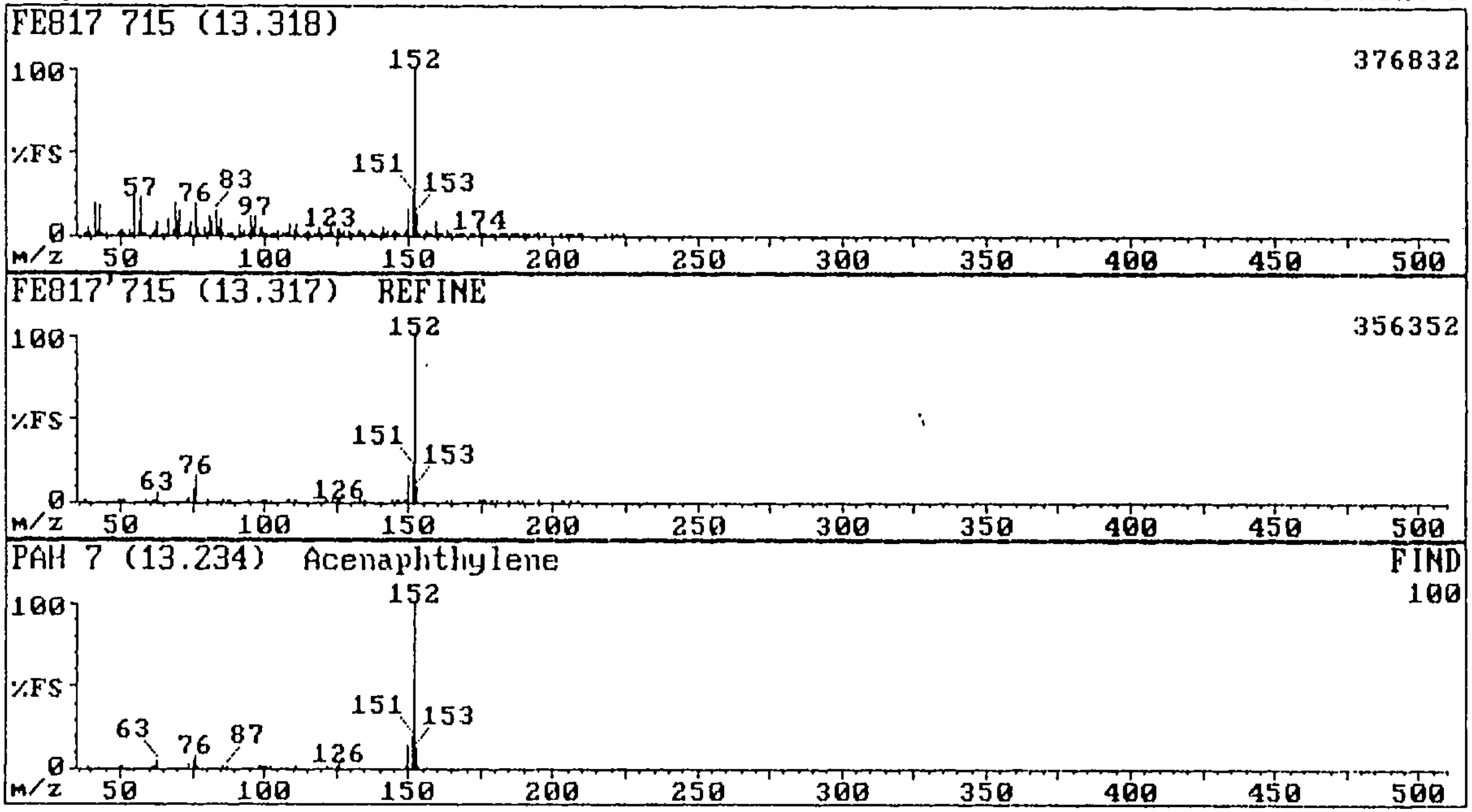
Sample:RUN#3 18976 Instrument F



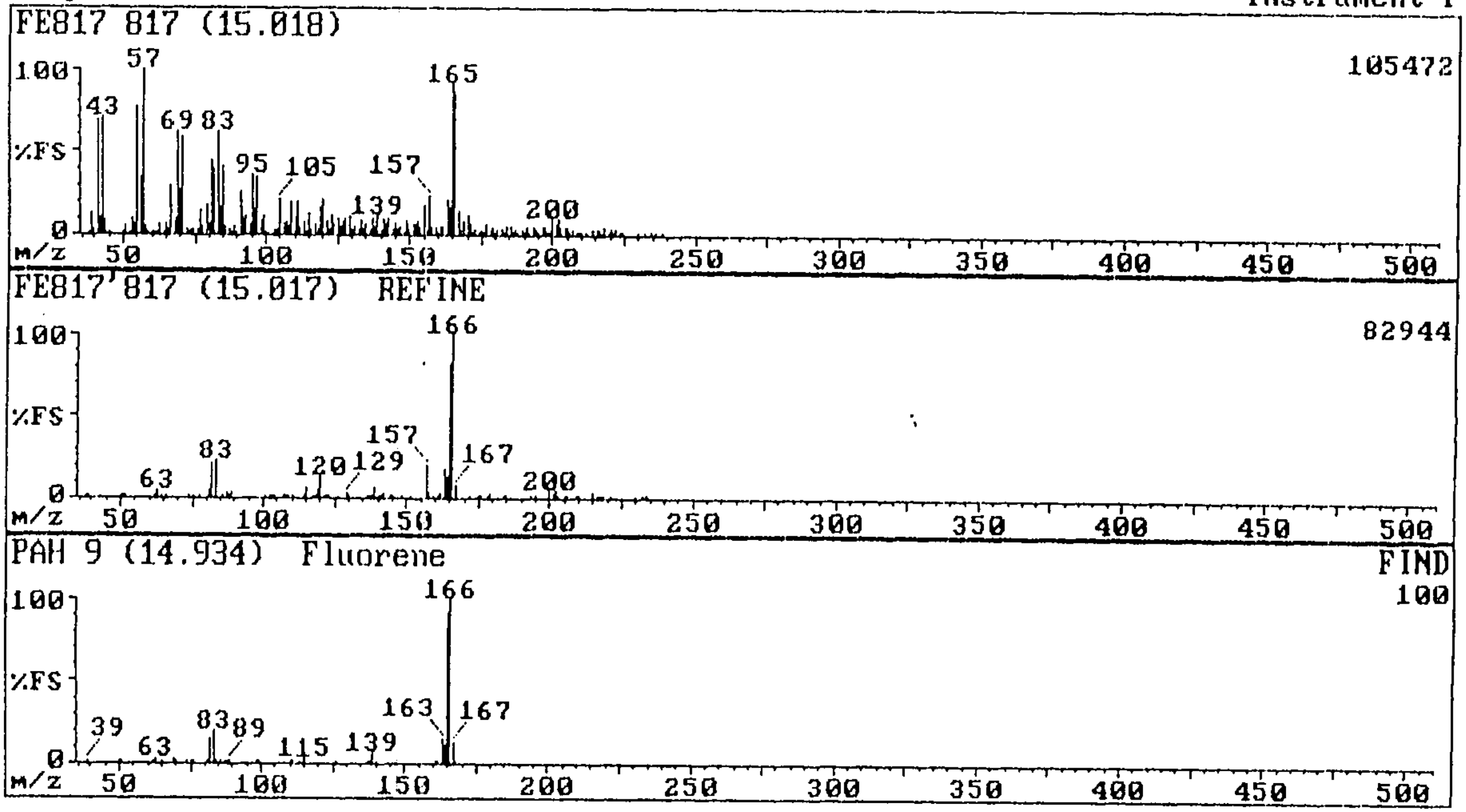
19-Sep-91 20:11 Triangle Labs, Inc. (919) 544-5729
Sample:RUN#3 18976 Instrument F



19-Sep-91 20:11 Triangle Labs, Inc. (919) 544-5729
Sample:RUN#3 18976 Instrument F

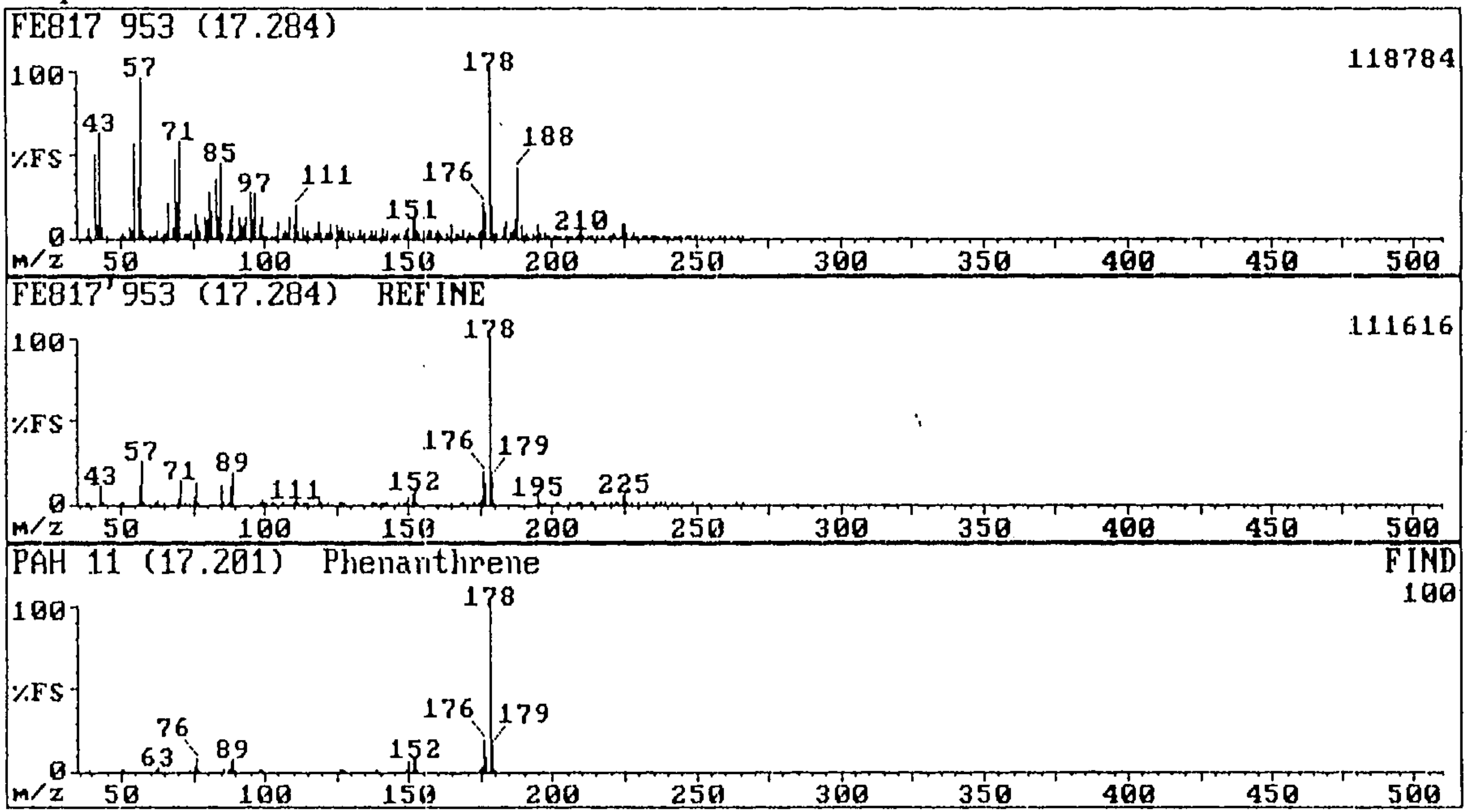


19-Sep-91 20:11 Triangle Labs, Inc. (919) 544-5729
Sample:RUN#3 18976 Instrument F



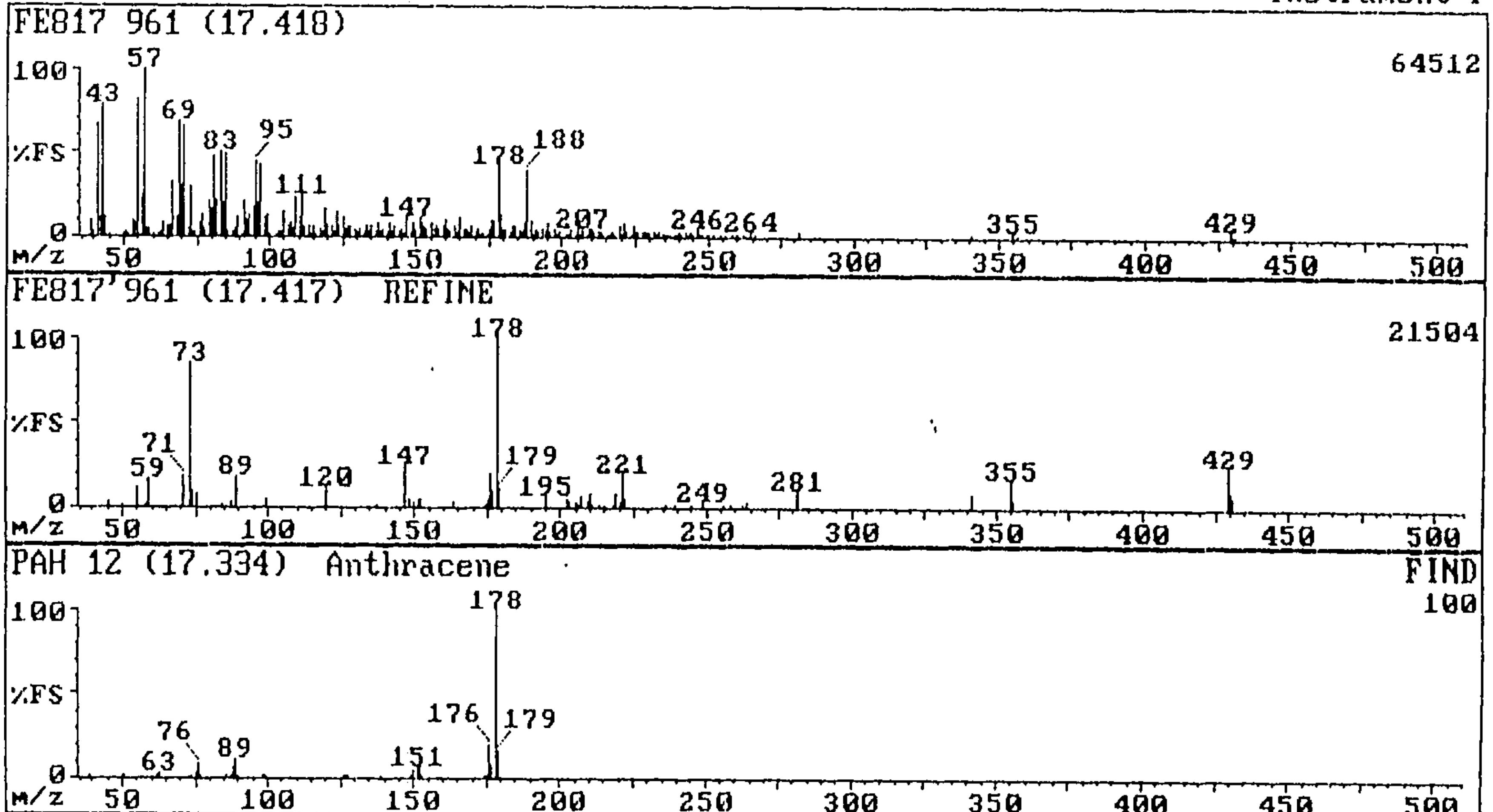
19-Sep-91 20:11 Triangle Labs, Inc. (919) 544-5729

Sample:RUN#3 18976 Instrument F

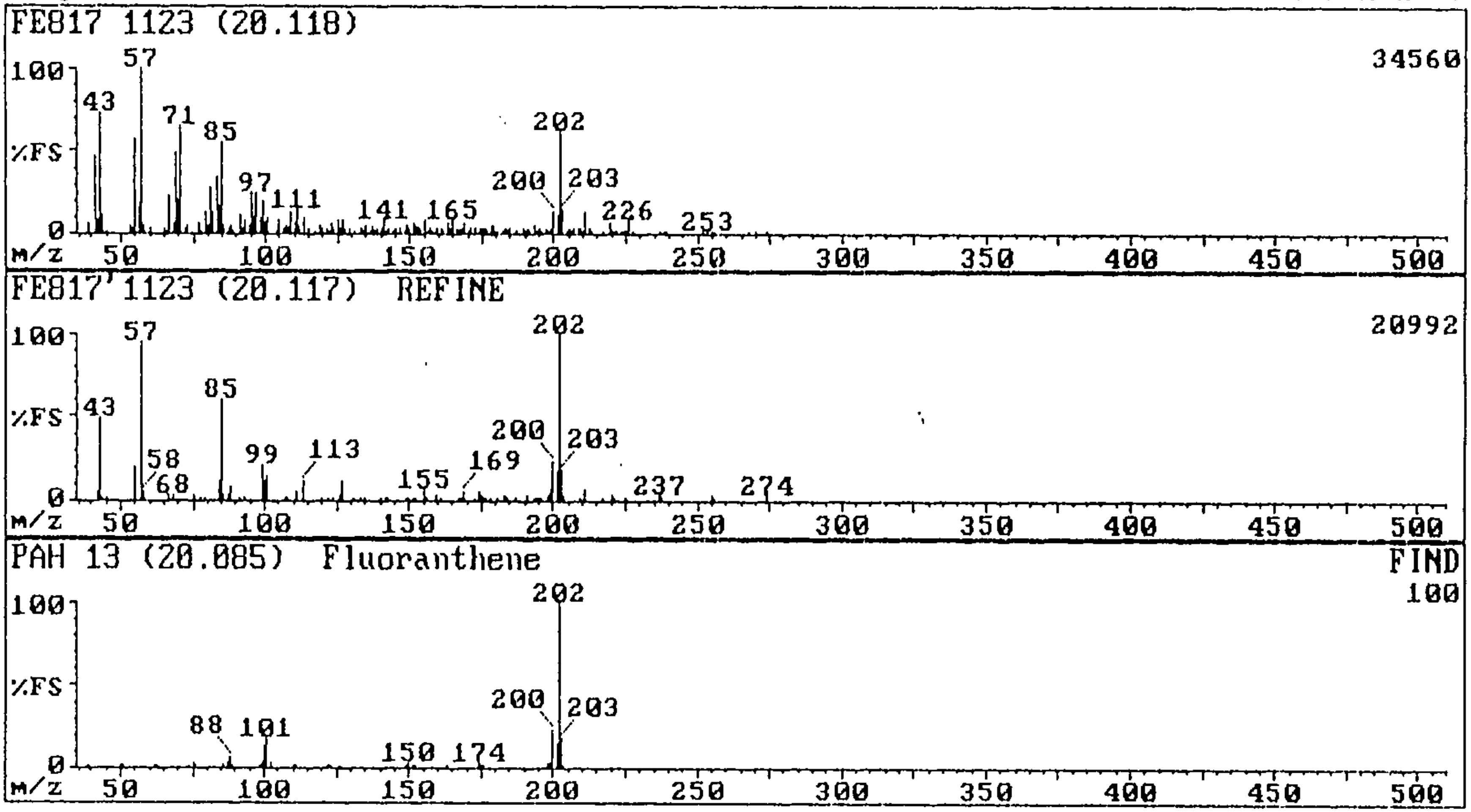


19-Sep-91 20:11 Triangle Labs, Inc. (919) 544-5729

Sample:RUN#3 18976 Instrument F



19-Sep-91 20:11 Triangle Labs, Inc. (919) 544-5729
Sample:RUN#3 18976 Instrument F



TRIANGLE LABORATORIES, INC.
801 Capitola Drive
Durham, NC 27713
Telephone: (919) 544-5729

DATA FILE:FE909
RF FILE: FE901
DATE: 09/30/91
TLI Project Number: 18976
ANALYSIS DATE: 09/25/91

SAMPLE ID: RUN #3 (1:4 dil.)
DILN FACTOR: 4
TLI Sample ID: 46.062.1A.H

QUANTITATION REPORT

NAME	AREA	RF	SCAN	ISID	AMOUNT, ug	CODE	QUAN LIMIT
1,4-Dichlorobenzene-d4	911		303	1		IS	
Naphthalene-d8	3390		478	14		IS	
Naphthalene	6445	.9408	481	14	323.34	D	40
2-Methylnaphthalene	2133	.7942	582	14	126.79	D	40
Acenaphthene-d10	2112		729	28		IS	
2-Chloronaphthalene	0	.9237	0	28	1.64	ND	40
Acenaphthylene	2169	1.5395	707	28	106.71	D	40
Acenaphthene	0	.9778	0	28	1.55	ND	40
Fluorene	557	1.1415	808	28	36.98	E	40
Phenanthrene-d10	4543		941	47		IS	
Phenanthrene	713	.8666	943	47	28.97	E	40
Anthracene	0	.8724	0	47	.81	ND	40
Fluoranthene	118	1.3003	1113	47	3.20	E	40
Chrysene-d12	9935		1326	57		IS	
Pyrene	114	1.1620	1143	57	1.59	E	40
Benzo(a)anthracene	0	1.0992	0	57	.29	ND	40
Chrysene	0	1.0178	0	57	.32	ND	40
Perylene-d12	12078		1541	64		IS	
Benzo(b)fluoranthene	0	.9739	0	64	.27	ND	40
Benzo(k)fluoranthene	0	1.1928	0	64	.22	ND	40
Benzo(e)pyrene	0	.9749	0	64	.27	ND	40
Benzo(a)pyrene	0	1.0228	0	64	.26	ND	40
Perylene	0	.5802	0	64	.46	ND	40
Indeno(1,2,3-cd)pyrene	0	.8098	0	64	.33	ND	40
Dibenz(a,h)anthracene	0	.8430	0	64	.31	ND	40
Benzo(g,h,i)perylene	0	.9214	0	64	.29	ND	40

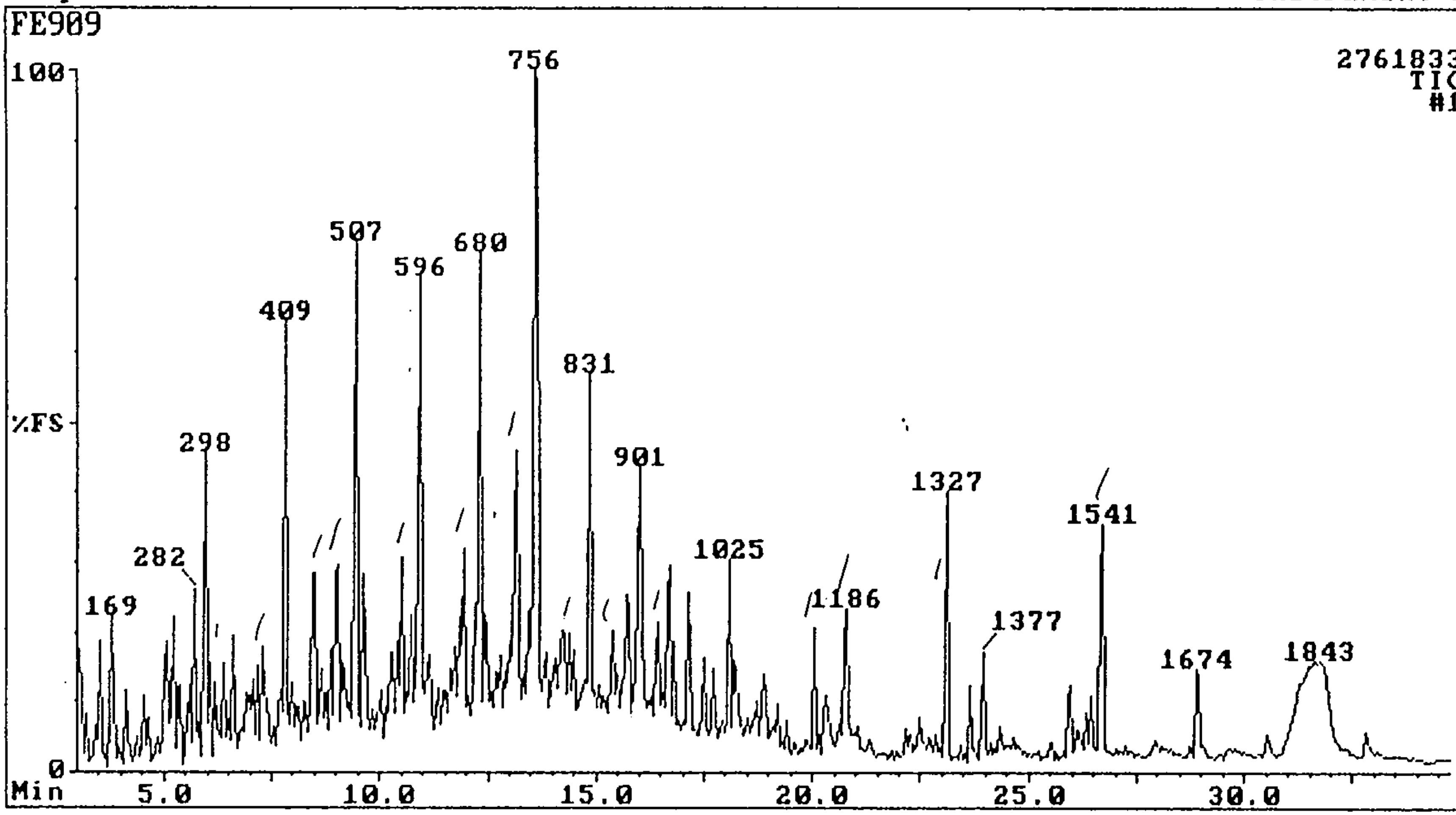
SURROGATE SUMMARY

	AREA	RF	SCAN	ISID	AMOUNT	CODE	% RECOVERY
Terphenyl-d14	3749	.8179	1186	57	73.81	D	73.8
Anthracene-d10	2131	.8804	948	47	85.27	D	85.3
Pyrene-d10	3382	.8714	1141	57	62.51	D	62.5
Phenol-d5	768	1.5876	274	1	84.98	D	85.0
2,4,6-Tribromophenol	259	.1108	843	28	177.14	D	177.1
1,4-Dibromobenzene-d4	377	.6186	486	1	107.05	D	107.1

CODES: ND = Not Detected; D = Detected; E = Estimated; IS = Internal Standard

25-Sep-91 14:55 Triangle Labs, Inc. (919) 544-5729

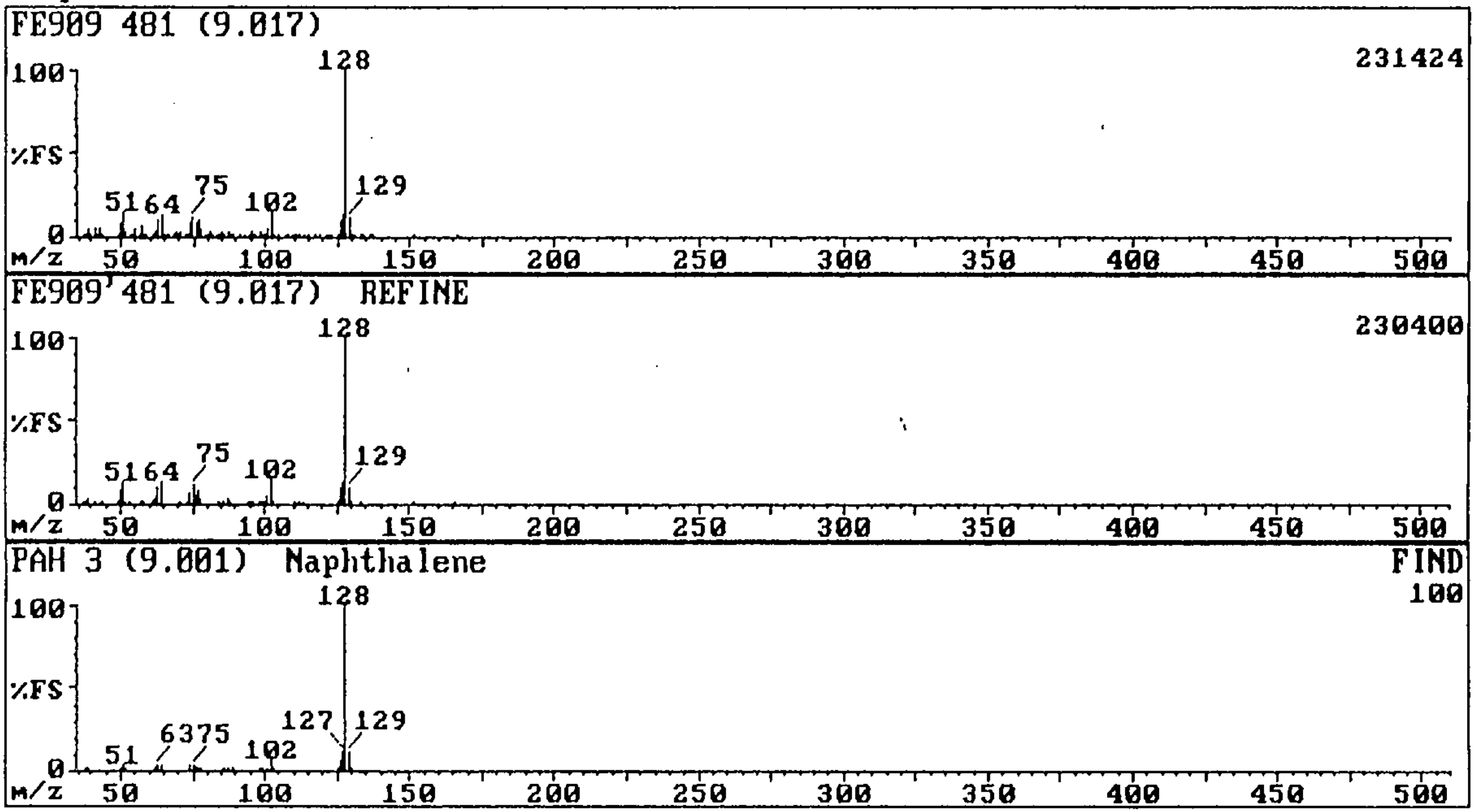
Sample:RUN#3 (1:4 DIL.) 18976 Instrument F



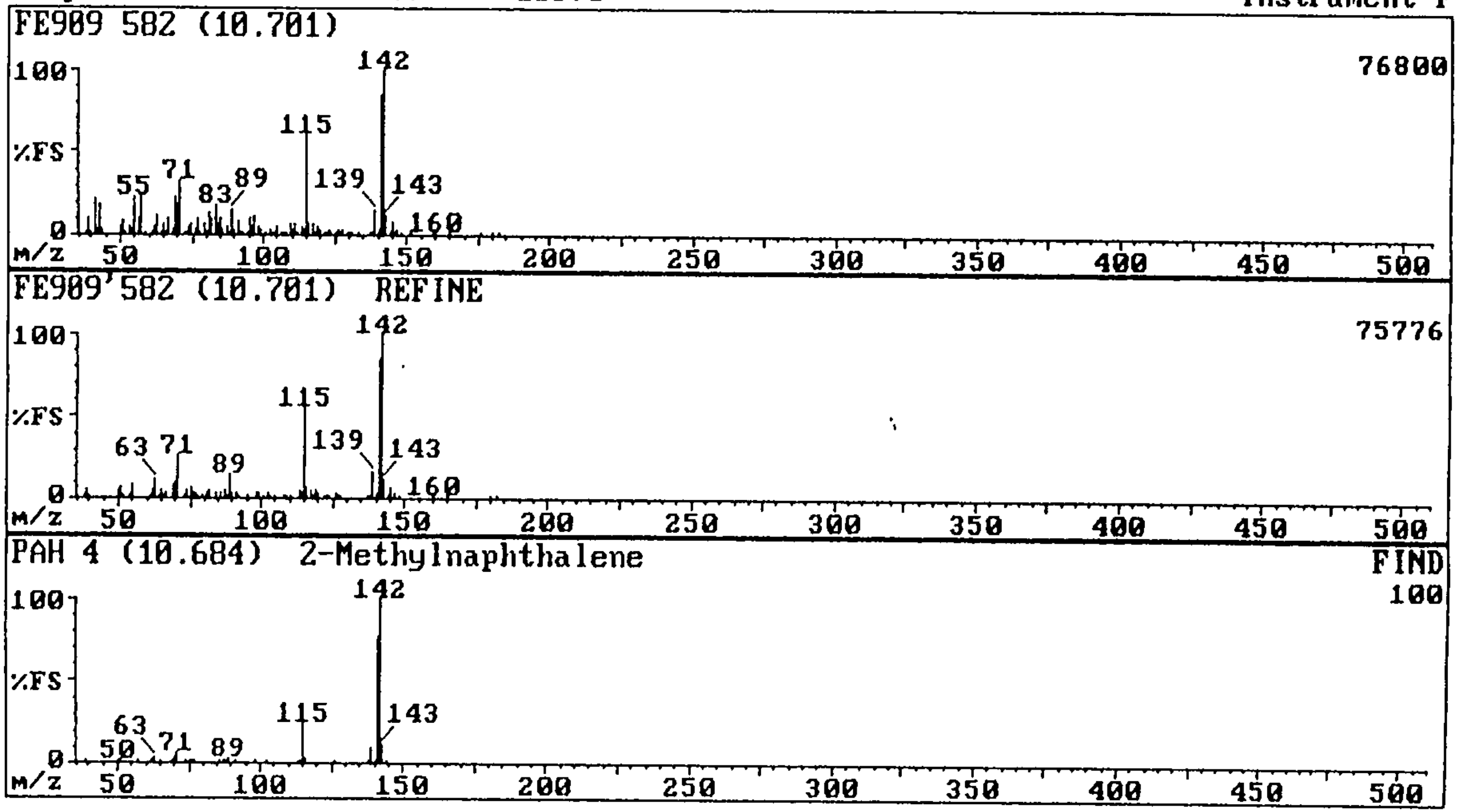
QUAN DB : FE909 LAB-BASE QUAN 25-Sep-91 16:3

#	MAT	FOR	REV	Delta	Area	P.Flags	Scan	QM	Name
1	89	58	96	1	91052	bb	303	152	1,4 Dichlorobenzene-d4
2	81	43	86	0	338980	bb	478	136	Naphthalene-d8
3	100	71	93	0	644510	bv	481	128	Naphthalene
4	89	56	87	0	213340	vb	582	142	2-Methylnaphthalene
5	81	42	88	0	211240	bb	729	164	Acenaphthene-d10
6	0	0	0	0	0		0	162	2-Chloronaphthalene
7	89	49	93	0	216900	vv	707	152	Acenaphthylene
8	0	0	0	0	0		0	153	Acenaphthene
9	60	28	76	-1	55740	vv	808	166	Fluorene
10	99	64	95	0	454270	vv	941	188	Phenanthrene-d10
11	63	26	91	-3	71272	vv	943	178	Phenanthrene
12	0	0	0	0	0		0	178	Anthracene
13	35	10	62	-3	11800	bb	1113	202	Fluoranthene
14	87	82	94	-3	993500	bb	1326	240	Chrysene-d12
15	86	63	97	2	374880	bb	1186	244	Terphenyl-d14
16	51	12	69	0	11440	bb	1143	202	Pyrene
17	0	0	0	0	0		0	228	Benzo(a)anthracene
18	0	0	0	0	0		0	228	Chrysene
19	92	79	92	2	1207800	bb	1541	264	Perylene-d12
20	0	0	0	0	0		0	252	Benzo(b)fluoranthene
21	0	0	0	0	0		0	252	Benzo(k)fluoranthene
22	0	0	0	0	0		0	252	Benzo(e)pyrene
23	0	0	0	0	0		0	252	Benzo(a)pyrene
24	0	0	0	0	0		0	252	Perylene
25	0	0	0	0	0		0	276	Indeno(1,2,3-cd)pyrene
26	0	0	0	0	0		0	278	Dibenz(a,h)anthracene
27	0	0	0	0	0		0	276	Benzo(g,h,i)perylene
28	0	0	0	0	0		0	266	Pentachlorophenol
29	80	49	88	-1	121460	vv	381	82	Nitrobenzene-d5
30	64	37	74	-1	97820	bb	643	172	2-Fluorobiphenyl
31	61	30	64	-2	25912	bb	843	330	2,4,6-Tribromophenol
32	85	46	90	0	76776	bb	274	99	Phenol-d5
33	99	74	96	1	338220	bb	1141	212	Pyrene-d10
34	80	53	96	-2	213140	vb	948	188	Anthracene-d10
35	67	27	89	-1	37684	bb	486	240	1,4-Dibromobenzene-d4
36	67	35	72	0	36224	bb	428	185	1,3,5-Trichlorobenzene-d3

25-Sep-91 14:55 Triangle Labs, Inc. (919) 544-5729
Sample:RUN#3 (1:4 DIL.) 18976 Instrument F

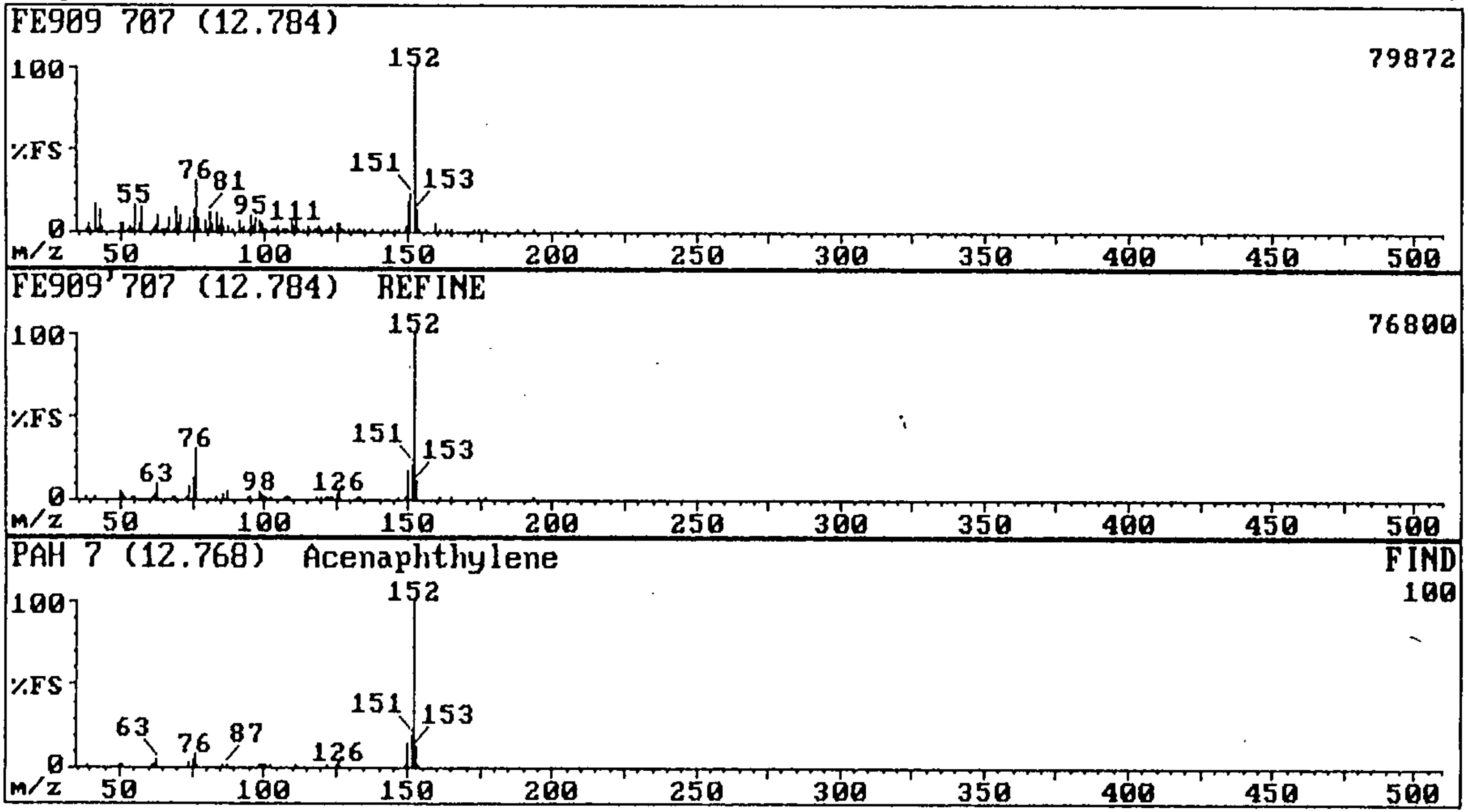


25-Sep-91 14:55 Triangle Labs, Inc. (919) 544-5729
Sample:RUN#3 (1:4 DIL.) 18976 Instrument F

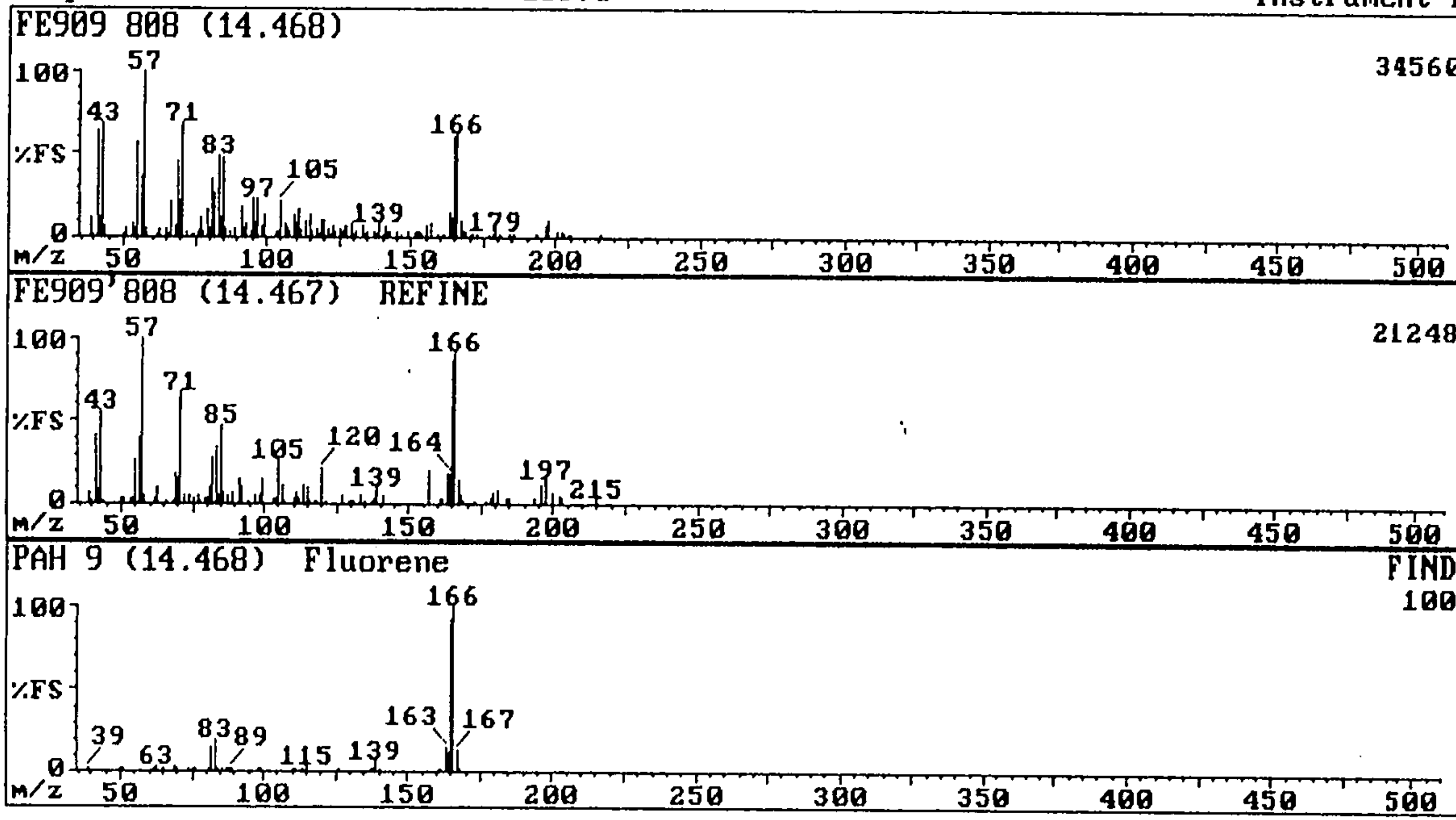


25-Sep-91 14:55 Triangle Labs, Inc. (919) 544-5729

Sample:RUN#3 (1:4 DIL.) 18976 Instrument F

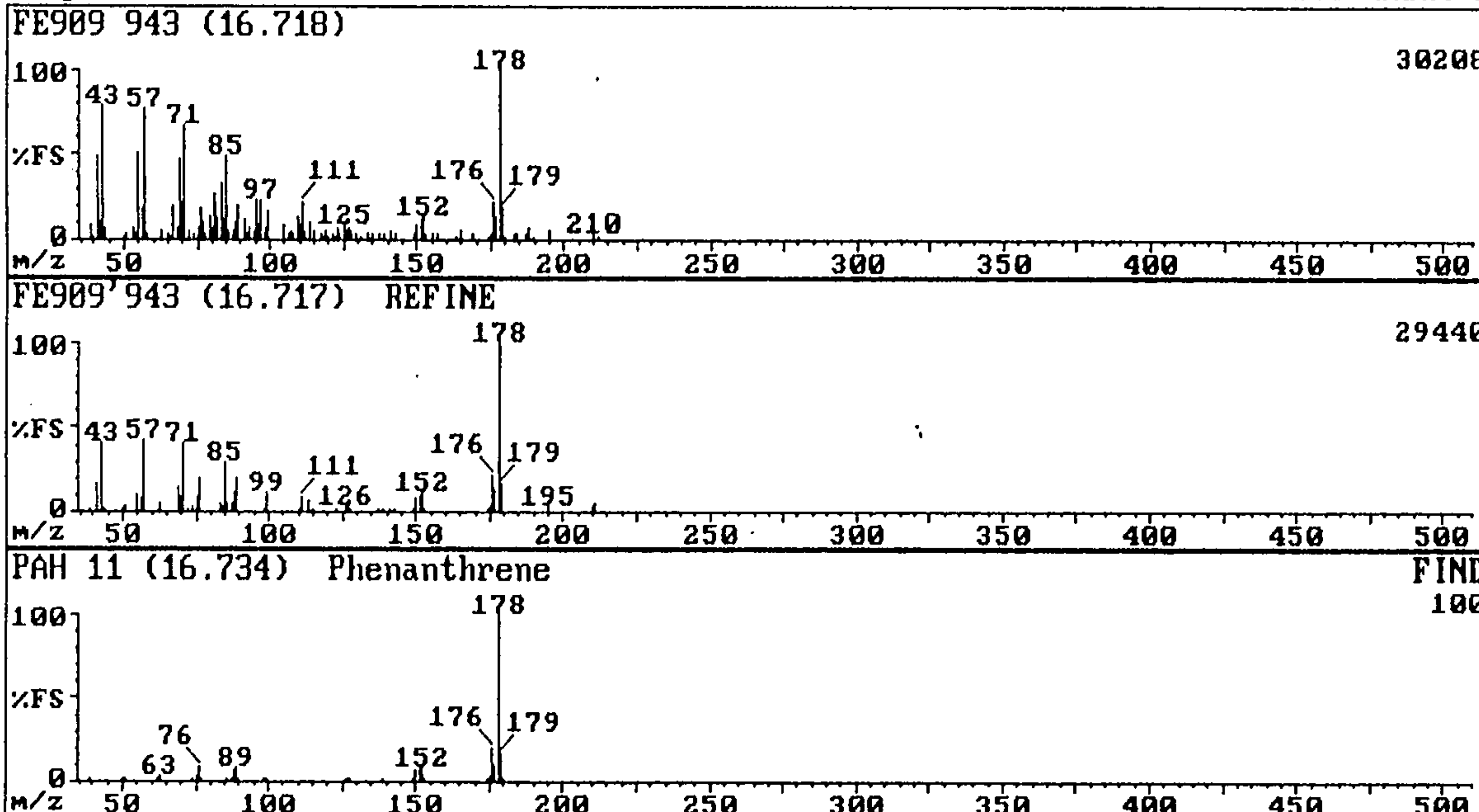


25-Sep-91 14:55 Triangle Labs, Inc. (919) 544-5729
Sample:RUN#3 (1:4 DIL.) 18976 Instrument F



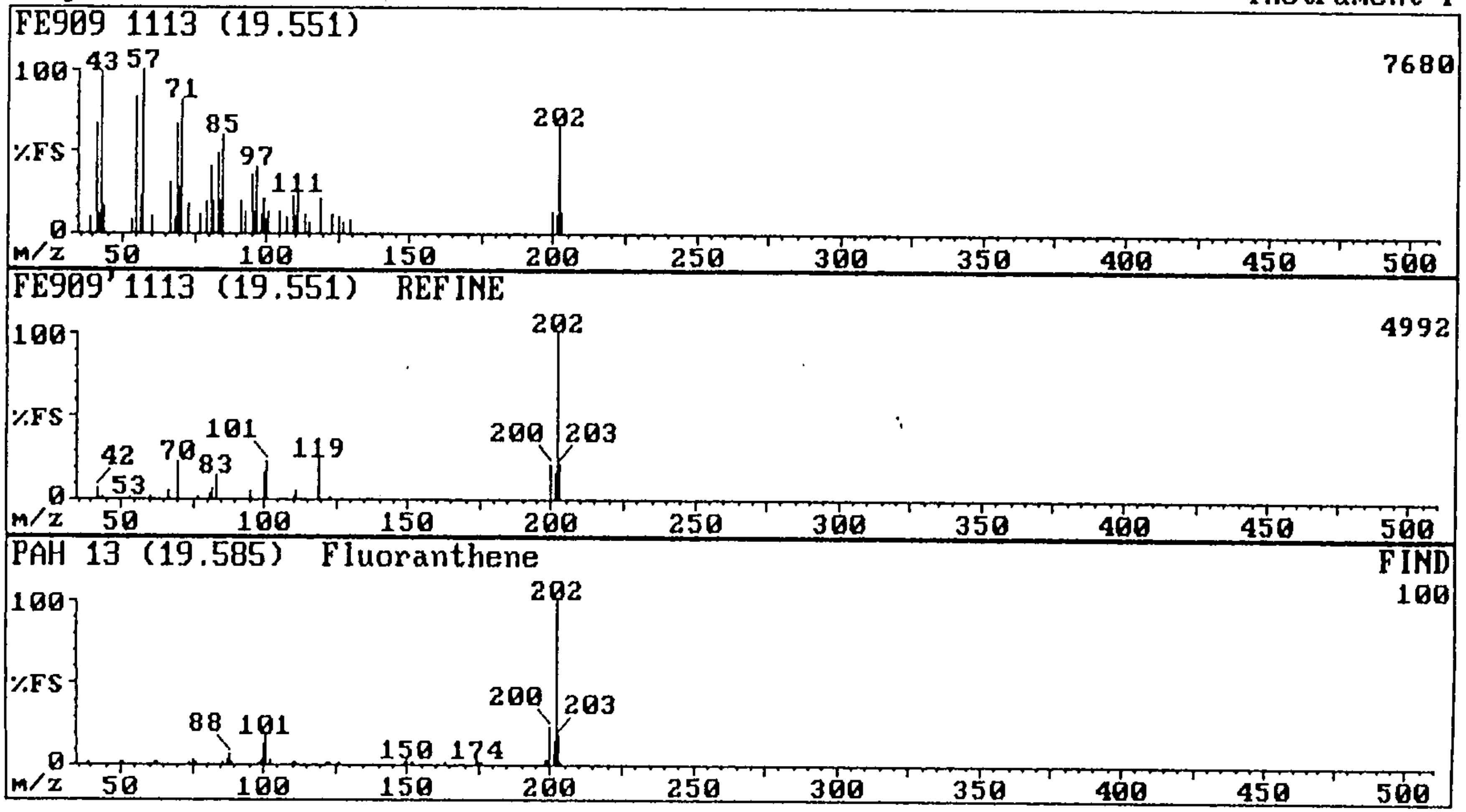
25-Sep-91 14:55 Triangle Labs, Inc. (919) 544-5729

Sample:RUN#3 (1:4 DIL.) 18976 Instrument F



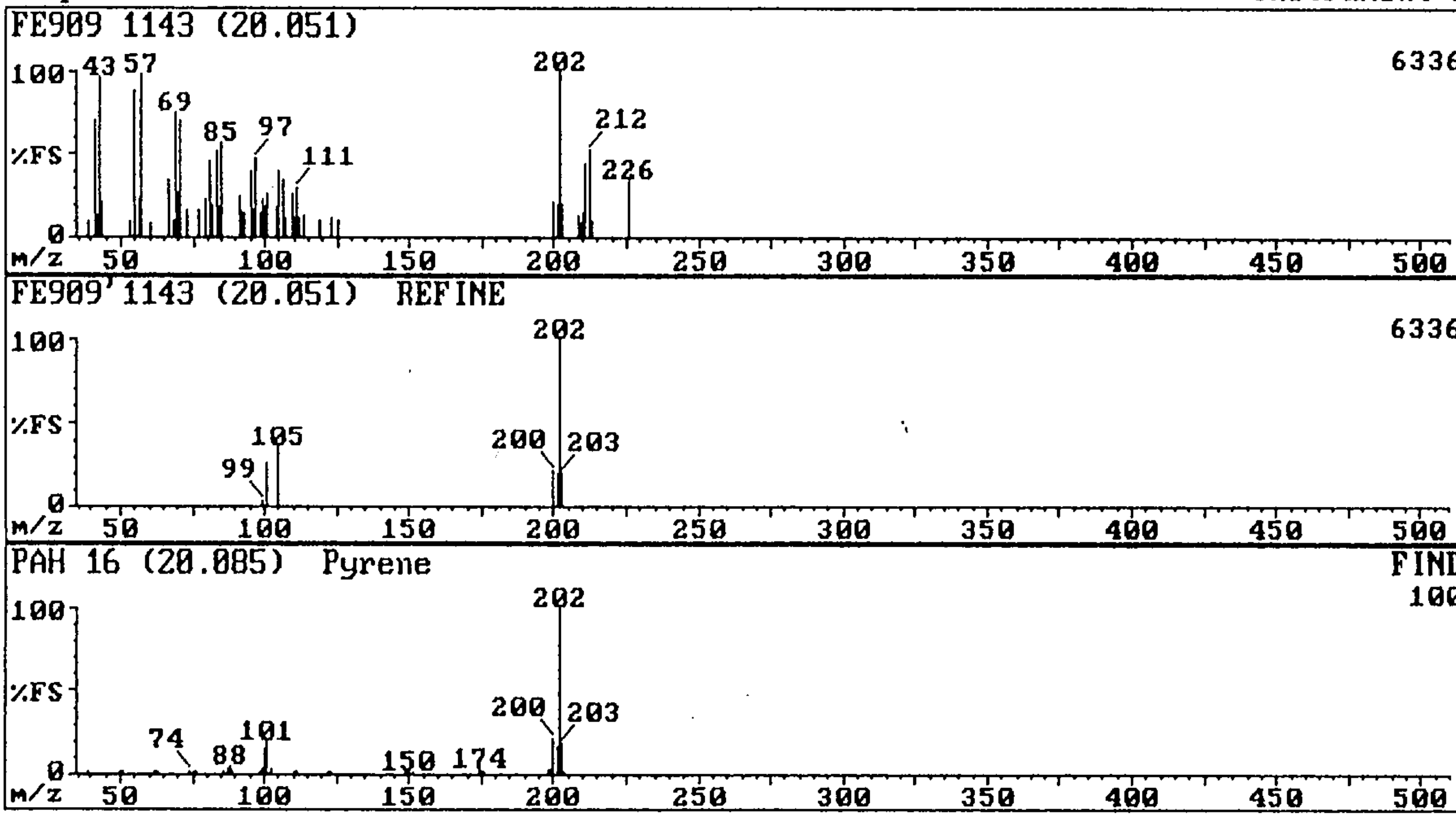
25-Sep-91 14:55 Triangle Labs, Inc. (919) 544-5729

Sample:RUN#3 (1:4 DIL.) 18976 Instrument F



25-Sep-91 14:55 Triangle Labs, Inc. (919) 544-5729

Sample:RUN#3 (1:4 DIL.) 18976 Instrument F



TRIANGLE LABORATORIES, INC.
801 Capitola Drive
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DATA FILE:FE818
RF FILE: FE807
DATE: 09/30/91
TLI Project Number: 18976
ANALYSIS DATE: 09/19/91

SAMPLE ID: XAD BLANK
DILN FACTOR: 1
TLI Sample ID: 46.062.2

QUANTITATION REPORT

NAME	AREA	RF	SCAN	ISID	AMOUNT, ug	CODE	QUAN LIMIT
1,4-Dichlorobenzene-d4	1886		304	1		IS	
Naphthalene-d8	7998		479	14		IS	
Naphthalene	1661	.9104	482	14	9.13	E	10
2-Methylnaphthalene	0	.7186	0	14	.14	ND	10
Acenaphthene-d10	5436		732	28		IS	
2-Chloronaphthalene	0	.9327	0	28	.16	ND	10
Acenaphthylene	0	1.5120	0	28	.10	ND	10
Acenaphthene	0	1.0072	0	28	.15	ND	10
Fluorene	0	.9405	0	28	.16	ND	10
Phenanthrene-d10	9857		945	47		IS	
Phenanthrene	60	1.0774	948	47	.23	E	10
Anthracene	0	1.0176	0	47	.08	ND	10
Fluoranthene	0	1.1700	0	47	.07	ND	10
Chrysene-d12	13219		1337	57		IS	
Pyrene	0	.9377	0	57	.06	ND	10
Benzo(a)anthracene	0	1.0234	0	57	.06	ND	10
Chrysene	0	1.0396	0	57	.06	ND	10
Perylene-d12	13388		1555	64		IS	
Benzo(b)fluoranthene	0	.8831	0	64	.07	ND	10
Benzo(k)fluoranthene	0	.9783	0	64	.06	ND	10
Benzo(e)pyrene	0	.8487	0	64	.07	ND	10
Benzo(a)pyrene	0	.9448	0	64	.06	ND	10
Perylene	0	.5627	0	64	.11	ND	10
Indeno(1,2,3-cd)pyrene	0	.8595	0	64	.07	ND	10
Dibenz(a,h)anthracene	0	.9225	0	64	.06	ND	10
Benzo(g,h,i)perylene	0	.9620	0	64	.06	ND	10

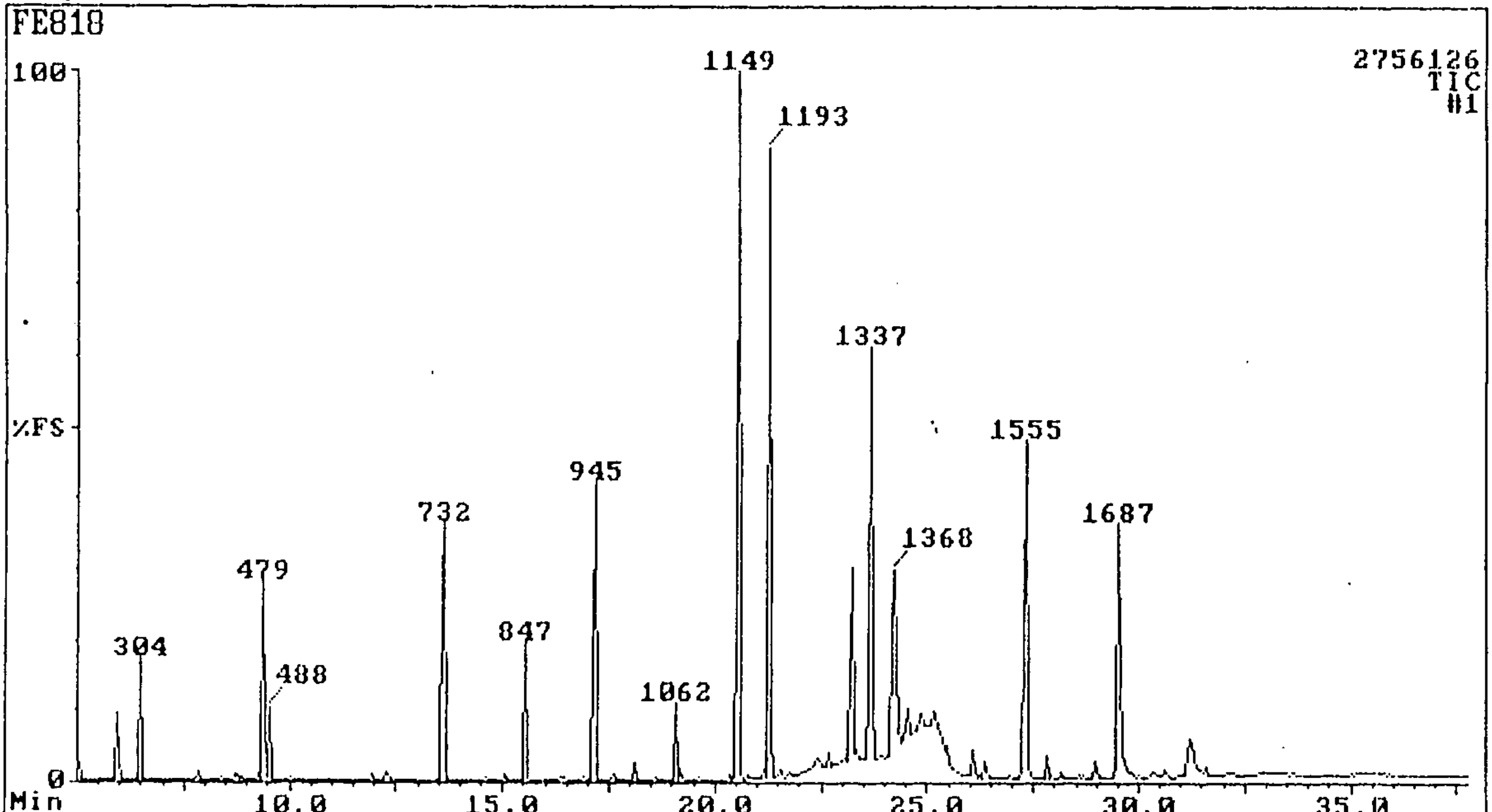
SURROGATE SUMMARY

	AREA	RF	SCAN	ISID	AMOUNT	CODE	% RECOVERY
Terphenyl-d14	21282	.6288	1193	57	102.42	D	102.4
Anthracene-d10	9857	.9242	945	47	43.28	D	43.3
Pyrene-d10	22909	.6547	1149	57	105.89	D	105.9
Phenol-d5	1988	1.1959	273	1	35.25	D	35.3
2,4,6-Tribromophenol	1696	.0779	847	28	160.19	D	160.2
1,4-Dibromobenzene-d4	1306	.4698	487	1	58.96	D	59.0

CODES: ND = Not Detected; D = Detected; E = Estimated; IS = Internal Standard

19-Sep-91 20:59 Triangle Labs, Inc. (919) 544-5729

Sample:XAD BLANK 18976 Instrument F

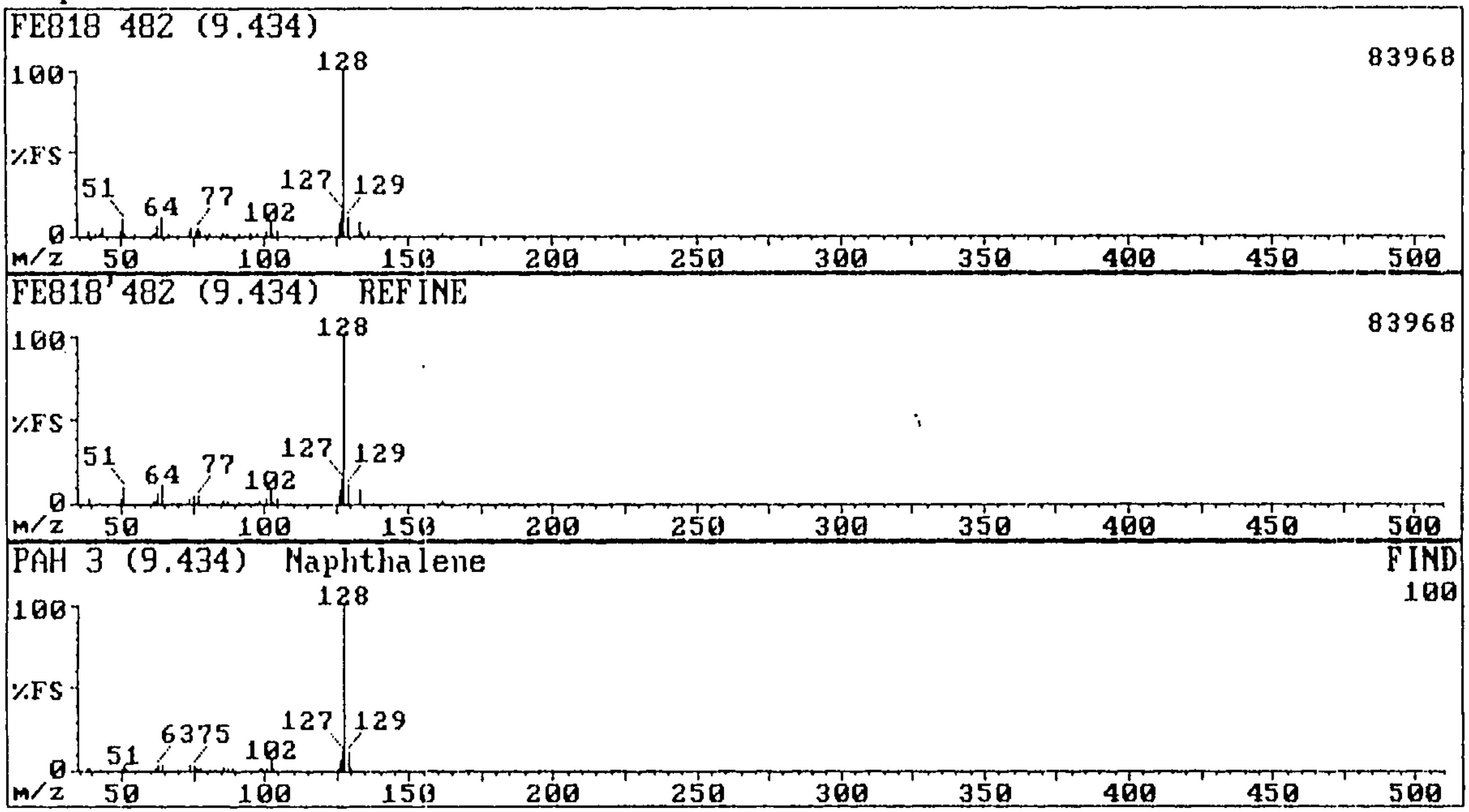


QUAN DB : FE818 LAB-BASE QUAN 19-Sep-91 23:04

	MAT	FOR	REV	Delta	Area	F.Flags	Scan	QM	Name
1	100	87	98	0	188600	bb	304	152	1,4 Dichlorobenzene-d4
2	100	89	92	-1	799620	bb	479	136	Naphthalene-d8
3	100	83	95	1	166080	bb	482	128	Naphthalene
4	48	19	64	1	5< ~~2340~~	bb	~~504~~	142	2-Methylnaphthalene
5	100	97	99	1	543630	bb	732	164	Acenaphthene-d10
6	0	0	0	0	0		0	162	2-Chloronaphthalene
7	0	0	0	0	0		0	152	Acenaohthylene
8	0	0	0	0	0		0	153	Acenaphthene
9	0	0	0	0	0		0	166	Fluorene
10	100	93	97	0	985650	bv	945	188	Phenanthrene-d10
11	48	16	60	0	6048	bb	948	178	Phenanthrene
12	21	16	62	-8	5< ~~6048~~	bb	~~948~~	178	Anthracene
13	0	0	0	0	0		0	202	Fluoranthene
14	100	83	93	0	1321900	bb	1337	240	Chrysene-d12
15	100	89	98	1	2128200	vb	1193	244	Terphenyl-d14
16	0	0	0	0	0		0	202	Pyrene
17	0	0	0	0	0		0	228	Benzo(a)anthracene
18	0	0	0	0	0		0	228	Chrysene
19	100	88	92	0	1338800	bb	1555	264	Perylene-d12
20	0	0	0	0	0		0	252	Benzo(b)fluoranthene
21	0	0	0	0	0		0	252	Benzo(k)fluoranthene
22	0	0	0	0	0		0	252	Benzo(e)pyrene
23	0	0	0	0	0		0	252	Benzo(a)pyrene
24	0	0	0	0	0		0	252	Perylene
25	0	0	0	0	0		0	276	Indeno(1,2,3-cd)pyrene
26	0	0	0	0	0		0	278	Dibenz(a,h)anthracene
27	0	0	0	0	0		0	276	Benzo(g,h,i)perylene
28	0	0	0	0	0		0	266	Pentachlorophenol
29	0	0	0	0	0		0	82	Nitrobenzene-d5
30	0	0	0	0	0		0	172	2-Fluorobiphenyl
31	95	71	81	0	169610	bb	847	330	2,4,6-Tribromophenol
32	100	91	97	0	198790	bb	273	99	Phenol-d5
33	100	89	96	1	2290900	bb	1149	212	Pyrene-d10
34	51	92	97	-8	985650	bv	945	188	Anthracene-d10
35	100	94	96	-1	130580	bb	487	240	1,4-Dibromobenzene-d4
36	0	0	0	0	0		0	185	1,3,5-Trichlorobenzene-d3

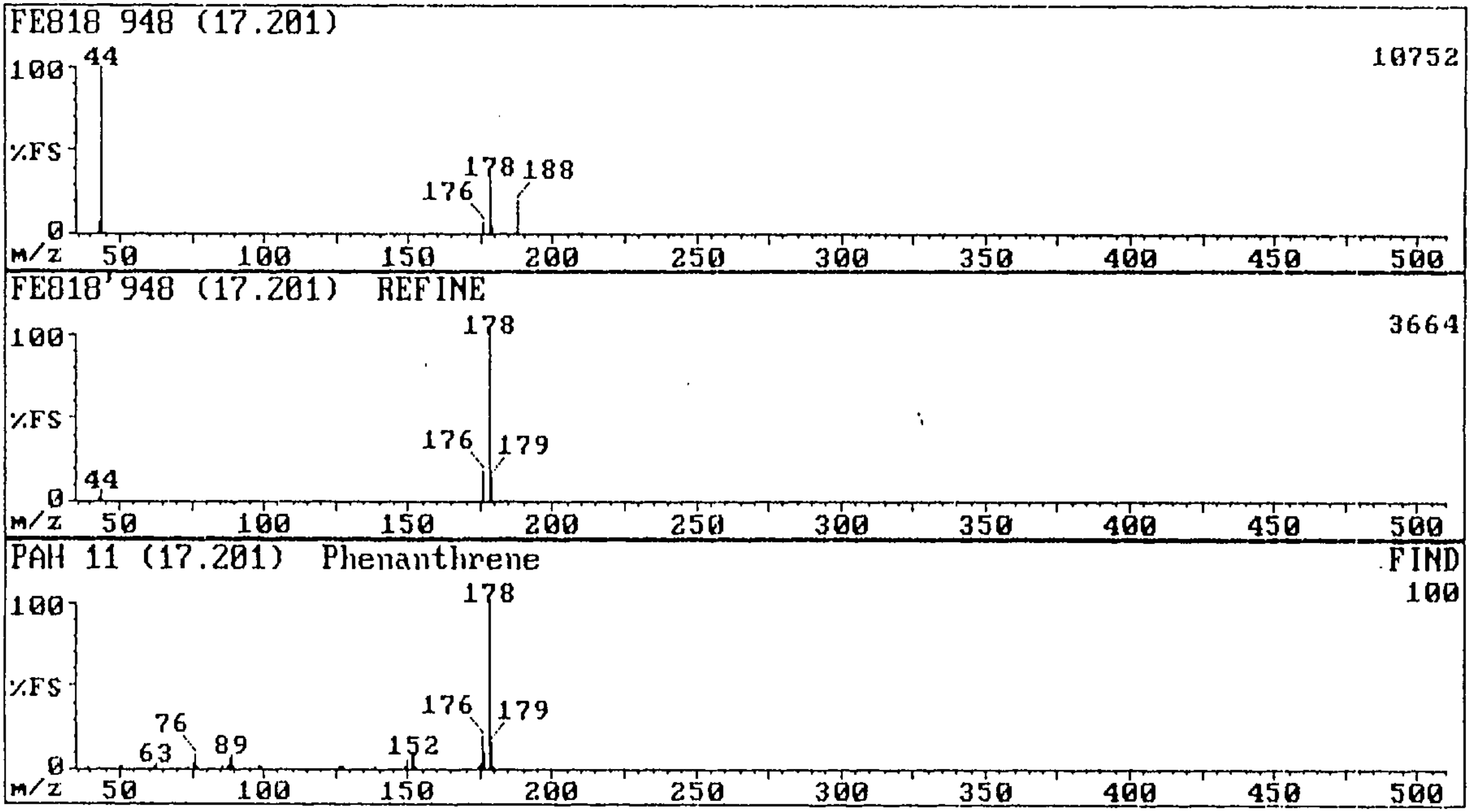
19-Sep-91 20:59 Triangle Labs, Inc. (919) 544-5729

Sample:XAD BLANK 18976 Instrument F



19-Sep-91 20:59 Triangle Labs, Inc. (919) 544-5729

Sample:XAD BLANK 18976 Instrument F



TRIANGLE LABORATORIES, INC.
801 Capitola Drive
Durham, NC 27713
Telephone: (919) 544-5729

DATA FILE:FE814
RF FILE: FE807
DATE: 09/30/91
TLI Project Number: 18976
ANALYSIS DATE: 09/19/91

SAMPLE ID: SBLK 091991
DILN FACTOR: 1
TLI Sample ID:

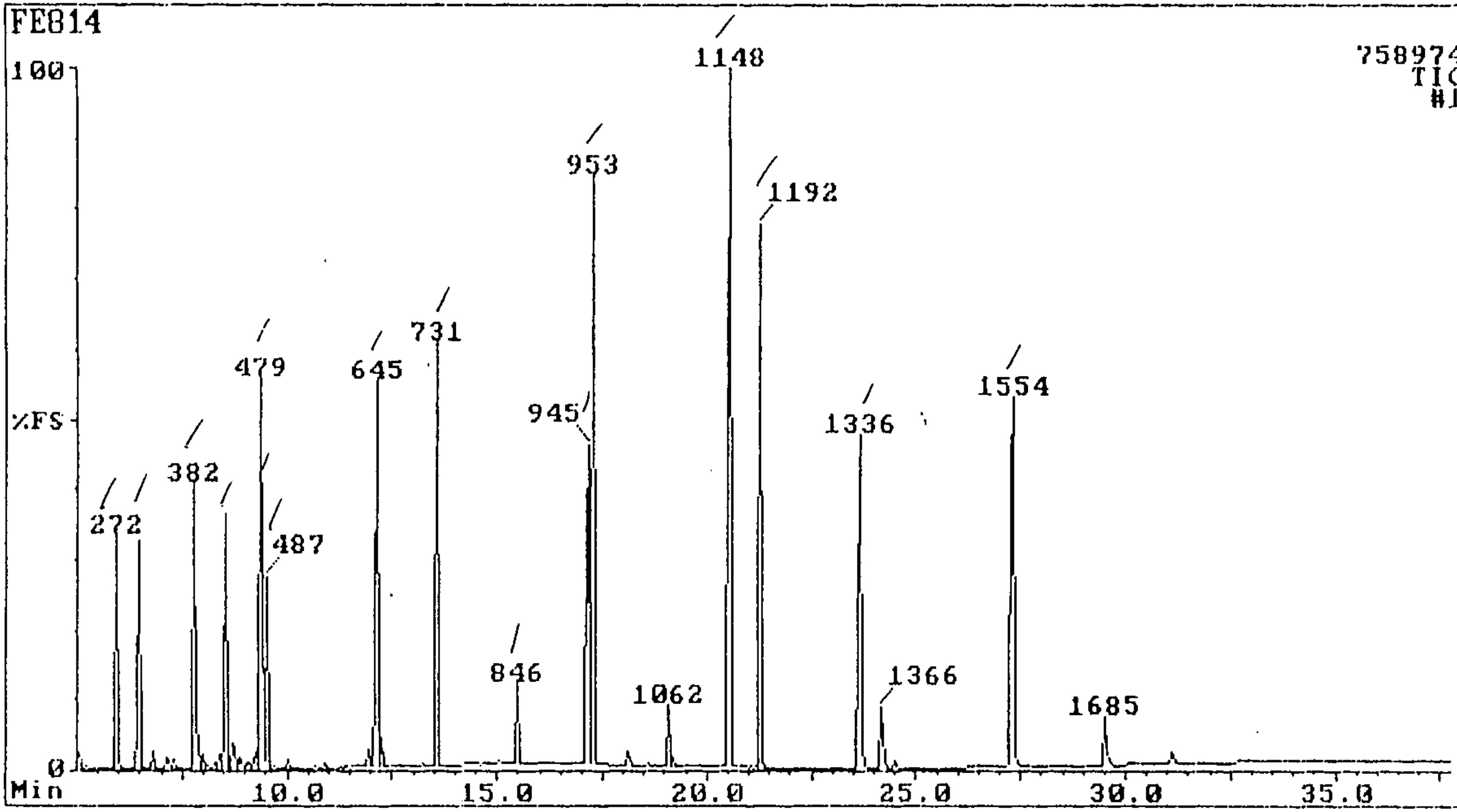
QUANTITATION REPORT

NAME	AREA	RF	SCAN	ISID	AMOUNT, ug	CODE	QUAN LIMIT
1,4-Dichlorobenzene-d4	1040		304	1		IS	
Naphthalene-d8	4104		479	14		IS	
Naphthalene	1905	.9104	482	14	20.39	D	10
2-Methylnaphthalene	0	.7186	0	14	.27	ND	10
Acenaphthene-d10	2302		731	28		IS	
2-Chloronaphthalene	0	.9327	0	28	.37	ND	10
Acenaphthylene	0	1.5120	0	28	.23	ND	10
Acenaphthene	0	1.0072	0	28	.35	ND	10
Fluorene	0	.9405	0	28	.37	ND	10
Phenanthrene-d10	2594		945	47		IS	
Phenanthrene	0	1.0774	0	47	.29	ND	10
Anthracene	0	1.0176	0	47	.30	ND	10
Fluoranthene	0	1.1700	0	47	.26	ND	10
Chrysene-d12	2805		1335	57		IS	
Pyrene	0	.9377	0	57	.30	ND	10
Benzo(a)anthracene	0	1.0234	0	57	.28	ND	10
Chrysene	0	1.0396	0	57	.27	ND	10
Perylene-d12	3560		1554	64		IS	
Benzo(b)fluoranthene	0	.8831	0	64	.25	ND	10
Benzo(k)fluoranthene	0	.9783	0	64	.23	ND	10
Benzo(e)pyrene	0	.8487	0	64	.26	ND	10
Benzo(a)pyrene	0	.9448	0	64	.24	ND	10
Perylene	0	.5627	0	64	.40	ND	10
Indeno(1,2,3-cd)pyrene	0	.8595	0	64	.26	ND	10
Dibenz(a,h)anthracene	0	.9225	0	64	.24	ND	10
Benzo(g,h,i)perylene	0	.9620	0	64	.23	ND	10

SURROGATE SUMMARY	AREA	RF	SCAN	ISID	AMOUNT	CODE	% RECOVERY
Terphenyl-d14	4237	.6288	1192	57	96.09	D	96.1
Anthracene-d10	4932	.9242	953	47	82.30	D	82.3
Pyrene-d10	4614	.6547	1148	57	100.51	D	100.5
Phenol-d5	1718	1.1959	272	1	55.27	D	55.3
2,4,6-Tribromophenol	250	.0779	846	28	55.72	D	55.7
1,4-Dibromobenzene-d4	671	.4698	487	1	54.94	D	54.9

CODES: ND = Not Detected; D = Detected; E = Estimated; IS = Internal Standard

19-Sep-91 17:48 Triangle Labs, Inc. (919) 544-5729
Sample:SBLK 091291 18976 Instrument F

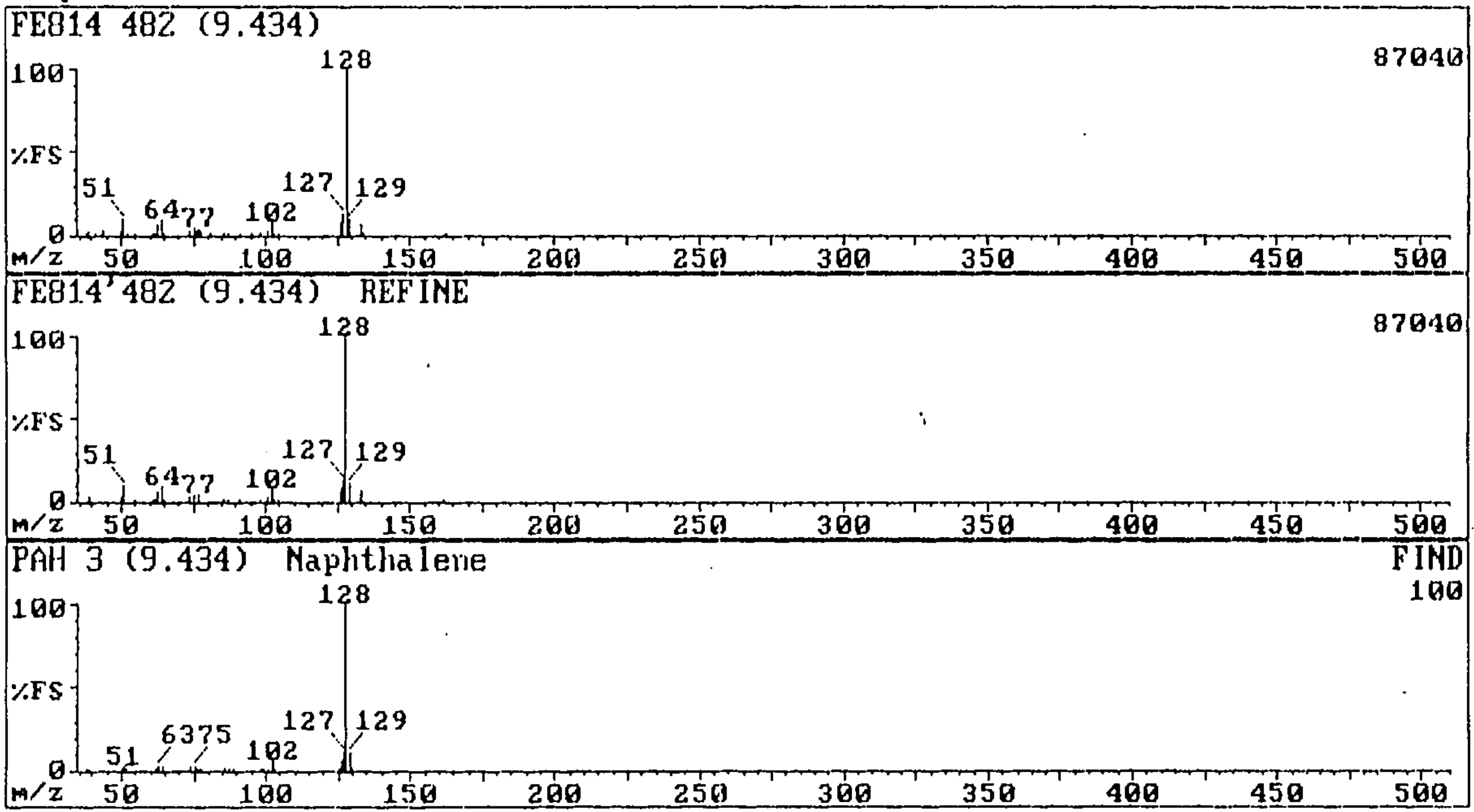


QUAN DB : FE814 LAB-BASE QUAN 19-Sep-91 22:54

N	MAT	FOR	REV	Delta	Area	P.Flags	Scan	QM	Name
1	100	90	99	0	103950	bb	304	152	1,4 Dichlorobenzene-d4
2	100	93	96	-1	410370	bb	479	136	Naphthalene-d8
3	100	87	96	1	190460	bb	482	128	Naphthalene
4	0	0	0	0	0		0	142	2-Methylnaphthalene
5	100	98	99	0	230160	bb	731	164	Acenaphthene-d10
6	0	0	0	0	0		0	162	2-Chloronaphthalene
7	0	0	0	0	0		0	152	Acenaphthylene
8	0	0	0	0	0		0	153	Acenaphthene
9	0	0	0	0	0		0	166	Fluorene
10	100	94	97	1	259370	bv	945	188	Phenanthrene-d10
11	0	0	0	0	0		0	178	Phenanthrene
12	0	0	0	0	0		0	178	Anthracene
13	0	0	0	0	0		0	202	Fluoranthene
14	100	96	98	-2	260480	bb	1335	240	Chrysene-d12
15	100	90	97	2	423670	bb	1192	244	Terphenyl-d14
16	0	0	0	0	0		0	202	Pyrene
17	0	0	0	0	0		0	228	Benzo(a)anthracene
18	0	0	0	0	0		0	228	Chrysene
19	100	95	97	1	356020	bb	1554	264	Perylene-d12
20	0	0	0	0	0		0	252	Benzo(b)fluoranthene
21	0	0	0	0	0		0	252	Benzo(k)fluoranthene
22	0	0	0	0	0		0	252	Benzo(e)pyrene
23	0	0	0	0	0		0	252	Benzo(a)pyrene
[illegible]	0	0	0	0	0		0	252	Perylene
[illegible]	0	0	0	0	0		0	276	Indeno(1,2,3-cd)pyrene
26	0	0	0	0	0		0	278	Dibenz(a,h)anthracene
27	0	0	0	0	0		0	276	Benzo(g,h,i)perylene
28	0	0	0	0	0		0	266	Pentachlorophenol
29	100	94	97	1	185640	bb	382	82	Nitrobenzene-d5
30	100	97	99	0	339760	bb	644	172	2-Fluorobiphenyl
31	84	63	71	0	24976	bb	846	330	2,4,6-Tribromophenol
32	100	92	97	-1	171790	bb	272	99	Phenol-d5
33	100	90	98	2	461400	bb	1148	212	Pyrene-d10
34	100	93	99	0	493200	vb	953	188	Anthracene-d10
35	100	93	96	-1	67072	bb	487	240	1,4-Dibromobenzene-d4
36	98	82	86	1	113660	bb	429	185	1,3,5-Trichlorobenzene-d3

19-Sep-91 17:48 Triangle Labs, Inc. (919) 544-5729

Sample:SBLK 091291 18976 Instrument F



VI. LABORATORY ANALYSIS

B. FORMALDEHYDE

AMERICAN INTERPLEX
CORPORATION
LABORATORIES

8600 Kanis Road
Little Rock, Arkansas 72204-2322
(501) 224-5060

Ramcon Environmental Corporation (C-488)
223 Scott Street
Memphis, TN 38112

October 14, 1991

ATTN: Mr. Joe Sewell

Control No. 4495

Description of Sample: Nine (9) impinger solution samples received on 10/3/91
Re: Lehman Roberts

Results:

Sample Identification	Formaldehyde, mg
D.I. Water Blank	<0.01
DNPH Blank	0.015
$MeCl_2$ Blank	<0.01
Run 1	9.5
Run 2	11
Run 3	0.94

Method: EPA 8315

AMERICAN INTERPLEX CORPORATION

By Steven Lovell

Steven Lovell
Technical Director

SL/td

VI. LABORATORY ANALYSIS

C. PARTICULATE

Form REC#8

SAMPLE ANALYTICAL DATA FORM

Company Name LEHMAN ROBERTS-RM 202-FRONT HALF (ACETONE)

Sample Location ______ Relative Humidity in Lab 43 %

Blank Volume (V_a) 168 ml Density of Acetone (ρ_a) .7857 mg/ml

Date/Time wt. blank 9-6-91 11:30AM Gross wt. 169.1139 g

Date/Time wt. blank 9-6-91 5:30PM Gross wt. 169.1138 g

Ave. Gross wt. 169.1139 g

Tare wt. 169.1134 g

Weight of blank (m_{ab}) 0.0003 g

Acetone blank residue concentration (C_a) : (C_a) = (m_{ab}) / (V_a) (ρ_a) = (0.0000022 mg/g)

Acetone Blank Wt. : $W_a = C_a V_{aw} \rho_a$ = (0.0000022) (291) (.7857) = (0.0005 g)

		Run # 1	Run # 2	Run # 3
Acetone rinse volume (V_{aw})	ml	291	291	291
Date/Time of wt. 9-6-91 11:30AM Gross wt.	g	171.8832	171.7618	161.1763
Date/Time of wt. 9-9-91 8:30AM Gross wt.	g	171.8827	171.7620	161.1761
Average Gross wt.	g	171.8830	171.7619	161.1762
Tare wt.	g	171.8718	171.7403	161.1538
Less Acetone blank wt. (W_a)	g	0.0005	0.0005	0.0005
Weight of particulate in acetone rinse (m_a)	g	0.0107	0.0211	0.0219

Filter Numbers	#	PT 5469	PT 5467	PT 5462
Date/Time of wt. 9-5-91 10AM Gross wt.	g	0.5652	0.5763	0.5725
Date/Time of wt. 9-6-91 11:30AM Gross wt.	g	0.5657	0.5763	0.5724
Average Gross wt.	g	0.5655	0.5763	0.5725
Tare wt.	g	0.5614	0.5624	0.5624

Weight of particulate on filter (m_f)	g	0.0041	0.0139	0.0101
Weight of particulate in acetone rinse (m_a)	g	0.0107	0.0211	0.0219
Total weight of particulate (m_n)	g	0.0148	0.0350	0.0320

NOTE: In no case should a blank residue greater than 0.01 mg/g (or 0.001% of the blank weight) be subtracted from the sample weight.

Remarks: BROWN PARTICULATE PRESENT

Signature of Analyst Jim Huey Signature of Reviewer ______

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Form REC#8

SAMPLE ANALYTICAL DATA FORM

Company Name LEHMAN-ROBERTS-RM202-BACKHALF(MeCl2)

Sample Location ______ Relative Humidity in Lab 43 %

Blank Volume (V_a) 168 ml MeCl2 BLANK Density of Acetone (ρ_a) 1.3255 mg/ml

Date/Time wt. blank ______ Gross wt. 134.1008 g

Date/Time wt. blank ______ Gross wt. 134.1006 g

Ave. Gross wt. 134.1007 g

Tare wt. 134.1011 g

Weight of blank (m_{ab}) 0.0004 g

MeCl2 ~~Acetone~~ blank residue concentration (C_a) : (C_a) = (m_{ab}) / (V_a) (ρ_a) = (0.0000016 mg/g)

MeCl2 ~~Acetone~~ Blank Wt. : $W_a = C_a V_{aw} \rho_a$ = (0.0000016) (201) (1.3255) = (0.0004 g)

		Run # 1	Run # 2	Run # 3
MeCl2 ~~Acetone~~ rinse volume (V_{aw})	ml	201	201	201
Date/Time of wt. 9-12-91 9:30Am Gross wt.	g	125.4376	168.9698	175.5666
Date/Time of wt. 9-13-91 3:30Pm Gross wt.	g	125.4372	168.9695	175.5670
Average Gross wt.	g	125.4374	168.9697	175.5668
Tare wt.	g	125.4350	168.9670	175.5653
Less MeCl2 ~~Acetone~~ blank wt. (W_a)	g	0.0004	0.0004	0.0004
Weight of particulate in acetone rinse (m_a)	g	0.0020	0.0023	0.0011

Filter Numbers	#			
Date/Time of wt.______ Gross wt.	g			
Date/Time of wt.______ Gross wt.	g			
Average Gross wt.	g			
Tare wt.	g			

Weight of particulate on filter (m_f)	g			
Weight of particulate in acetone rinse (m_a)	g			
Total weight of particulate (m_n)	g			

NOTE: In no case should a blank residue greater than 0.01 mg/g (or 0.001% of the blank weight) be subtracted from the sample weight.

Remarks: ______

Signature of Analyst [signature] Signature of Reviewer ______

D:\DONNA\FORMS\LAB\SAMPLE.TBL

MINNESOTA BACK-HALF ANALYSIS

CHLOROFORM-ETHER EXTRACTION

Plant Location L. ROBERTS - RM202-CPM

Date 9-5-91

Sample Location ______

Relative Humidity in lab 43 %

Blank Volume (V_a) 150 ml

DI H_2O

Date/Time wt. blank 9-4-91 9Am

Gross wt. 175.2107 g

Date/Time wt. blank 9-4-91 3pm

Gross wt. 175.2105 g

Ave. Gross wt. 175.2106 g

Tare wt. 175.2104 g

Weight of blank Extract 0.0002 g

		Run # 1	Run # 2	Run # 3
Impinger rinse volume	ml	1146	1269	1151
Date/Time of wt 9-12-91 [illegible] Gross wt	g	137.1410	164.5157	171.11[illegible]
Date/Time of wt 9-13-91 10Am Gross wt	g	137.1406	164.5152	171.1162
Average Gross wt	g	137.1408	164.5155	171.1160
Tare wt	g	137.1374	164.5[illegible]	171.1[illegible]
Less Extract blank wt	g	0.00[illegible]	[illegible]2	0.00[illegible]
Wt of particulate in impinger rinse (m_a)	g	0.0032	0.0073	0.0021

Remarks: ______

Signature of Analyst [signature]

Signature of Reviewer ______

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AP-42 Section 11.1
Reference
Report Sect. 4
Reference 45
VOL. II

RAMCON

ENVIRONMENTAL CORPORATION

AIR POLLUTION SOURCE TESTING AT

LEHMAN ROBERTS COMPANY
Memphis, Tennessee
VOLUME II

Submitted to:

LEHMAN ROBERT COMPANY
P.O. Box 666
Memphis, Tennessee 38101

and

NATIONAL ASPHALT PAVEMENT ASSOCIATION
5100 Forbes Boulevard
NAPA Building
Lanham, Maryland 20706-4413

Submitted on:

October 23, 1991

Submitted by:

RAMCON ENVIRONMENTAL CORPORATION
223 Scott Street
Memphis, Tennessee 38112
901/458-7000

VII. CALCULATIONS

A. PAH'S

LEHMAN ROBERTS - FOR NAPA
MPHS, TN - PAH'S

SUMMARY OF TEST DATA

			9-3-91	9-3-91	9-3-91
			RUN #1	RUN #2	RUN #3
SAMPLING TRAIN DATA					
		start	11:26	14:23	16:38
		finish	12:38	15:30	17:44
1.	Sampling time, minutes	Θ	60.0	60.0	60.0
2.	Sampling nozzle diameter, in.	D_n	.2500	.2500	.2500
3.	Sampling nozzle cross-sect. area, ft^2	A_n	.000341	.000341	.000341
4.	Isokinetic variation	I	111.9	97.6	97.8
5.	Sample gas volume - meter cond., cf.	V_m	37.776	38.113	39.703
6.	Average meter temperature, ^oR	T_m	561	577	578
7.	Avg. oriface pressure drop, in. H_2O	dH	1.34	1.32	1.39
8.	Total PAH collected, mg.	M_n	0.6129	0.5402	0.6276
VELOCITY TRAVERSE DATA					
9.	Stack area, ft^2	A	13.80	13.80	13.80
10.	Absolute stack gas pressure, in. Hg.	P_s	30.01	30.01	30.01
11.	Barometric pressure, in. Hg.	P_{bar}	30.01	30.01	30.01
12.	Avg. absolute stack temperature, R^o	T_s	715	715	715
13.	Average $\sqrt{\text{vel. head}}$, (C_p= .84)	$\sqrt{dP}$	0.89	0.95	0.98
14.	Average stack gas velocity, ft./sec.	V_s	63.38	67.29	69.31
STACK MOISTURE CONTENT					
15.	Total water collected by train, ml.	V_{ic}	632.00	545.00	557.00
16.	Moisture in stack gas, %	B_{ws}	46.21	43.03	42.63
EMISSIONS DATA					
17.	Stack gas flow rate, dscf/hr.(000's)	Q_{sd}	1254	1410	1463
18.	Stack gas flow rate, cfm	acfm	52479	55716	57389
19.	PAH concentration, gr/dscf	C_s	0.000272	0.000245	0.000273
20.	PAH concentration, lb/hr	E	0.049	0.049	0.057
21.					
ORSAT DATA					
22.	Percent CO_2 by volume	CO_2	8.70	7.30	7.70
23.	Percent O_2 by volume	O_2	4.70	5.70	5.00
24.	Percent CO by volume	CO	.00	.00	.00
25.	Percent N_2 by volume	N_2	86.60	87.00	87.30

Format: summryR3

Dry Gas Volume

$$V_{m(std)} = V_m \left[\frac{T_{(std)}}{T_m}\right] \left[\frac{P_{bar} + \frac{dH}{13.6}}{P_{(std)}}\right] = 17.64 \frac{^oR}{in.Hg}\, Y\, V_m \left[\frac{P_{bar} + \frac{dH}{13.6}}{T_m}\right]$$

Where:

$V_{m(std)}$ = Dry Gas Volume through meter at standard conditions, cu. ft.

V_m = Dry Gas Volume measured by meter, cu. ft.

P_{bar} = Barometric pressure at oriface meter, in. Hg.

P_{std} = Standard absolute pressure,(29.92 in. Hg.).

T_m = Absolute temperature at meter ^oR.

T_{std} = Standard absolute temperature (528^oR).

dH = Average pressure drop across oriface meter, in. H_2O.

Y = Dry gas meter calibration factor.

13.6 = Inches water per inches Hg.

RUN 1:

$$V_{m(std)} = (17.64)(\ .970)(\ 37.776) \left[\frac{(30.01) + \frac{1.34}{13.6}}{561}\right] = 34.691 \text{ dscf}$$

RUN 2:

$$V_{m(std)} = (17.64)(\ .970)(\ 38.113) \left[\frac{(30.01) + \frac{1.32}{13.6}}{577}\right] = 34.028 \text{ dscf}$$

RUN 3:

$$V_{m(std)} = (17.64)(\ .970)(\ 39.703) \left[\frac{(30.01) + \frac{1.39}{13.6}}{578}\right] = 35.392 \text{ dscf}$$

Total Contaminants by Weight: GRAIN LOADING

concentration C'_s gr./dscf.

$$C'_s = \left[0.0154 \frac{gr}{mg}\right] \left[\frac{M_n}{V_{m(std)}}\right]$$

Where:

C'_s = Concentration of PAH in stack gas, dry basis, corrected to standard conditions, gr./dscf.

M_n = Total amount of PAH collected, mg.

$V_{m(std)}$ = Dry gas volume through meter at standard conditions, cu. ft.

Run 1:

$$C'_s = \left[0.0154 \frac{gr}{mg}\right] \left[\frac{0.6129}{34.691}\right] = 0.000272 \text{ gr./dscf.}$$

Run 2:

$$C'_s = \left[0.0154 \frac{gr}{mg}\right] \left[\frac{0.5402}{34.028}\right] = 0.000245 \text{ gr./dscf.}$$

Run 3:

$$C'_s = \left[0.0154 \frac{gr}{mg}\right] \left[\frac{0.6276}{35.392}\right] = 0.000273 \text{ gr./dscf.}$$

Dry Molecular Weight

$$M_d = 0.44(\%CO_2) + 0.32(\%O_2) + 0.28(\%CO + \%N_2)$$

Where:

M_d = Dry molecular weight, lb./lb.-mole.

$\%CO_2$ = Percent carbon dioxide by volume (dry basis).

$\%O_2$ = Percent oxygen by volume (dry basis).

$\%N_2$ = Percent nitrogen by volume (dry basis).

$\%CO$ = Percent carbon monoxide by volume (dry basis).

0.264 = Ratio of O_2 to N_2 in air, v/v.

0.28 = Molecular weight of N_2 or CO, divided by 100.

0.32 = Molecular weight of O_2 divided by 100.

0.44 = Molecular weight of CO_2 divided by 100.

Run 1:

$$M_d = 0.44(\ 8.70\%) + 0.32(\ 4.70\%) + 0.28(\ .00\% + 86.60\%) = 29.58\ \frac{lb}{lb\text{-}mole}$$

Run 2:

$$M_d = 0.44(\ 7.30\%) + 0.32(\ 5.70\%) + 0.28(\ .00\% + 87.00\%) = 29.40\ \frac{lb}{lb\text{-}mole}$$

Run 3:

$$M_d = 0.44(\ 7.70\%) + 0.32(\ 5.00\%) + 0.28(\ .00\% + 87.30\%) = 29.43\ \frac{lb}{lb\text{-}mole}$$

Water Vapor Condensed

$$V_{wc_{std}} = \left[V_f - V_i \right] \left[\frac{p_w \; R \; T_{(std)}}{M_w \; P_{(std)}} \right] = 0.04707 \left[V_f - V_i \right]$$

$$V_{wsg_{std}} = \left[W_f - W_i \right] \left[\frac{R \; T_{(std)}}{M_w \; P_{(std)}} \right] = 0.04715 \left[W_f - W_i \right]$$

Where:

0.04707 = Conversion factor, $ft.^3/ml.$

0.04715 = Conversion factor, $ft.^3/g.$

$V_{wc_{std}}$ = Volume of water vapor condensed (standard conditions), scf.

$V_{wsg_{std}}$ = Volume of water vapor collected in silica gel (standard conditions), ml.

$V_f - V_i$ = Final volume of impinger contents less initial volume, ml.

$W_f - W_i$ = Final weight of silica gel less initial weight, g.

p_w = Density of water, 0.002201 lb/ml.

R = Ideal gas constant, 21.85 in.Hg. (cu.ft./lb.-mole)(^{o}R).

M_w = Molecular weight of water vapor, 18.0 lb/lb-mole.

T_{std} = Absolute temperature at standard conditions, 528^{o}R.

P_{std} = Absolute pressure at standard conditions, 29.92 inches Hg.

Run 1:

$V_{wc(std)}$ = (0.04707) (594.0) = 28.0 cu.ft
$V_{wsg(std)}$ = (0.04715) (38.0) = 1.8 cu.ft

Run 2:

$V_{wc(std)}$ = (0.04707) (516.0) = 24.3 cu.ft
$V_{wsg(std)}$ = (0.04715) (29.0) = 1.4 cu.ft

Run 3:

$V_{wc(std)}$ = (0.04707) (522.0) = 24.6 cu.ft
$V_{wsg(std)}$ = (0.04715) (35.0) = 1.7 cu.ft

Moisture Content of Stack Gases

$$B_{ws} = \frac{V_{wc_{std}} + V_{wsg_{std}}}{V_{wc_{std}} + V_{wsg_{std}} + V_{m_{std}}} \times 100$$

Where:

B_{ws} = Proportion of water vapor, by volume, in the gas stream.

V_m = Dry gas volume measured by dry gas meter,(dcf).

$V_{wc_{std}}$ = Volume of water vapor condensed corrected to standard conditions (scf).

$V_{wsg_{std}}$ = Volume of water vapor collected in silica gel corrected to standard conditions (scf).

Run 1:

$$B_{ws} = \frac{28.0 + 1.8}{28.0 + 1.8 + 34.691} \text{ X } 100 = 46.21\ \%$$

Run 2:

$$B_{ws} = \frac{24.3 + 1.4}{24.3 + 1.4 + 34.028} \text{ X } 100 = 43.03\ \%$$

Run 3:

$$B_{ws} = \frac{24.6 + 1.7}{24.6 + 1.7 + 35.392} \text{ X } 100 = 42.63\ \%$$

Molecular Weight of Stack Gases

$$M_s = M_d (1 - B_{ws}) + 18 (B_{ws})$$

Where:

M_s = Molecular weight of stack gas, wet basis, (lb./lb.-mole).

M_d = Molecular weight of stack gas, dry basis, (lb./lb.-mole).

Run 1:

M_s = 29.58 (1 - 46.21) + 18 (46.21) = 24.23 (lb./lb.-mole)

Run 2:

M_s = 29.40 (1 - 43.03) + 18 (43.03) = 24.49 (lb./lb.-mole)

Run 3:

M_s = 29.43 (1 - 42.63) + 18 (42.63) = 24.56 (lb./lb.-mole)

Stack Gas Velocity

$$V_s = K_p \, C_p \left[\sqrt{dP} \right] \text{avg.} \sqrt{\frac{T_{s(avg.)}}{P_s \; M_s}}$$

Where:

V_s	=	Average velocity of gas stream in stack, ft./sec.
K_p	=	85.49 ft/sec $\left[\text{(g/g-mole)-(mm Hg)} / (^{\circ}\text{K})(\text{mm } H_2O) \right]^{1/2}$
C_p	=	Pitot tube coefficient, (dimensionless).
dP	=	Velocity head of stack gas, in. H_2O.
P_{bar}	=	Barometric pressure at measurement site, (in. Hg).
P_g	=	Stack static pressure, (in. Hg).
P_s	=	Absolute stack gas pressure, (in. Hg) = $P_{bar} + P_g$
P_{std}	=	Standard absolute pressure, (29.92 in. Hg).
t_s	=	Stack temperature, ($^{\circ}$f).
T_s	=	Absolute stack temperature, ($^{\circ}$R). = 460 + t_s.
M_s	=	Molecular weight of stack gas, wet basis, (lb/lb-mole).

Run 1:

$$V = (85.49)(\ .84)(\ 0.89) \sqrt{\frac{715}{(30.01)(24.23)}} = 63.38 \text{ ft/sec.}$$

Run 2:

$$V = (85.49)(\ .84)(\ 0.95) \sqrt{\frac{715}{(30.01)(24.49)}} = 67.29 \text{ ft/sec.}$$

Run 3:

$$V = (85.49)(\ .84)(\ 0.98) \sqrt{\frac{715}{(30.01)(24.56)}} = 69.31 \text{ ft/sec.}$$

LEHMAN ROBERTS - FOR NAPA
MPHS, TN - PAH'S

Stack Gas Flow Rate

$$Q_{sd} = 3600 \left[1 - B_{wc} \right] V_s \; A \left[\frac{T_{std}}{T_{stk}} \right] \left[\frac{P_s}{P_{std}} \right]$$

Where:

Q_{sd} = Dry volumetric stack gas flow rate corrected to standard conditions, (dscf/hr).

A = Cross sectional area of stack, (ft.^{2}).

3600 = Conversion factor, (sec./hr.).

t_s = Stack temperature, (^{o}f).

T_s = Absolute stack temperature, (^{o}R).

T_{std} = Standard absolute temperature, (528^{o}R).

P_{bar} = Barometric pressure at measurement site, (in.Hg.).

P_g = Stack static pressure, (in.Hg.).

P_s = Absolute stack gas pressure, (in.Hg.); = $P_{bar} + P_g$

P_{std} = Standard absolute pressure, (29.92 in.Hg.).

Run 1:

$$Q_{sd}=3600(1- .4621)(63.38)(13.80) \left[\frac{528}{715} \right] \left[\frac{30.01}{29.92} \right] = 1254491.3 \frac{dscf}{hr}$$

Run 2:

$$Q_{sd}=3600(1- .4303)(67.29)(13.80) \left[\frac{528}{715} \right] \left[\frac{30.01}{29.92} \right] = 1410621.9 \frac{dscf}{hr}$$

Run 3:

$$Q_{sd}=3600(1- .4263)(69.31)(13.80) \left[\frac{528}{715} \right] \left[\frac{30.01}{29.92} \right] = 1463169.4 \frac{dscf}{hr}$$

Format: qR3

LEHMAN ROBERTS - FOR NAPA
MPHS, TN - PAH'S

Emissions Rate from Stack

$$E = \frac{(C_s)(Q_{sd})}{7000 \text{ gr./lb.}} = \text{lb. / hr.}$$

Where:

E = Emissions rate, lb/hr.

C_s = Concentration of PAH in stack gas, dry basis, corrected to standard conditions, gr/dscf.

Q_{sd} = Dry volumetric stack gas flow rate corrected to standard conditions, dscf/hr.

Run 1:

$$E = \frac{(0.000272)(1254491.3)}{7000} = 0.049 \text{ lb. / hr.}$$

Run 2:

$$E = \frac{(0.000245)(1410621.9)}{7000} = 0.049 \text{ lb. / hr.}$$

Run 3:

$$E = \frac{(0.000273)(1463169.4)}{7000} = 0.057 \text{ lb. / hr.}$$

LEHMAN ROBERTS - FOR NAPA
MPHS, TN - PAH'S

Isokinetic Variation

$$I = 100\ T_s \left[\frac{0.002669\ V_{ic} + (V_m / T_m)\ (P_{bar} + dH / 13.6)}{60\ \theta\ V_s\ P_s\ A_n} \right]$$

Where:

I	=	Percent isokinetic sampling.
100	=	Conversion to percent.
T_s	=	Absolute average stack gas temperature, ^oR.
0.002669	=	Conversion factor, Hg - ft^3/ml - ^oR.
V_{ic}	=	Ttl vol of liquid collected in impingers and silica gel, ml.
T_m	=	Absolute average dry gas meter temperature, ^oR.
P_{bar}	=	Barometric pressure at sampling site, (in. Hg).
dH	=	Av pressure differential across the oriface meter, (in.H_2O).
13.6	=	Specific gravity of mercury.
60	=	Conversion seconds to minutes.
θ	=	Total sampling time, minutes.
V_s	=	Stack gas velocity, ft./sec.
P_s	=	Absolute stack gas pressure, in. Hg.
A_n	=	Cross sectional area of nozzle, ft^2.

Run 1:

$$I = (100)(715) \left[\frac{(0.002669)(632.0) + \frac{37.776}{561} \left[30.01 + \frac{1.34}{13.6} \right]}{60\ (60.0)\ (63.38)\ (30.01)\ (.000341)} \right] = 111.9\%$$

Run 2:

$$I = (100)(715) \left[\frac{(0.002669)(545.0) + \frac{38.113}{577} \left[30.01 + \frac{1.32}{13.6} \right]}{60\ (60.0)\ (67.29)\ (30.01)\ (.000341)} \right] = 97.6\%$$

Run 3:

$$I = (100)(715) \left[\frac{(0.002669)(557.0) + \frac{39.703}{578} \left[30.01 + \frac{1.39}{13.6} \right]}{60\ (60.0)\ (69.31)\ (30.01)\ (.000341)} \right] = 97.8\%$$

Format: iR3

PERCENT EXCESS AIR

$$\% E_a = \frac{100 \times (\% O_2) - 0.5 (\% CO)}{0.264 (\% N_2) - (\% O_2) + 0.5 (\% CO)}$$

Where: $\%E_a$ = Percent excess air.

$\%O_2$ = Percent oxygen by volume, dry basis.

$\%CO$ = Percent carbon monoxide by volume, dry basis.

$\%CO_2$ = Percent carbon dioxide by volume, dry basis.

$\%N_2$ = Percent nitrogen by volume, dry basis.

Run # 1: $$\frac{100 \times (\% \ 4.70) - .05 (\% \ .00)}{0.264 (\% \ 86.60) - (\% \ 4.70) + 0.5 (\% \ .00)} = 25.9 \%$$

Run # 2: $$\frac{100 \times (\% \ 5.70) - .05 (\% \ .00)}{0.264 (\% \ 87.00) - (\% \ 5.70) + 0.5 (\% \ .00)} = 33.0 \%$$

Run # 3: $$\frac{100 \times (\% \ 5.00) - .05 (\% \ .00)}{0.264 (\% \ 87.30) - (\% \ 5.00) + 0.5 (\% \ .00)} = 27.7 \%$$

VII. CALCULATIONS

B. FORMALDEHYDE

LEHMAN ROBERTS - FOR NAPA
MEMPHIS, TENNESSEE

FORMALDEHYDE

SUMMARY OF TEST DATA

			9-30-91 RUN #1	9-30-91 RUN #2	9-30-91 RUN #3
	SAMPLING TRAIN DATA				
		start	10:56	13:42	16:13
		finish	12:24	14:59	17:30
1.	Sampling time, minutes	Θ	72.0	72.0	72.0
2.	Sampling nozzle diameter, in.	D_n	.2700	.2700	.2700
3.	Sampling nozzle cross-sect. area, ft^2	A_n	.000398	.000398	.000398
4.	Isokinetic variation	I	98.5	99.5	98.6
5.	Sample gas volume - meter cond., cf.	V_m	51.918	52.036	52.728
6.	Average meter temperature, ^oR	T_m	553	561	565
7.	Avg. oriface pressure drop, in. H_2O	dH	1.31	1.28	1.30
8.	Total formaldehyde collected, mg.	M_n	9.50	11.00	.94
	VELOCITY TRAVERSE DATA				
9.	Stack area, ft^2.	A	13.88	13.88	13.88
10.	Absolute stack gas pressure, in. Hg.	P_s	30.15	30.15	30.15
11.	Barometric pressure, in. Hg.	P_{bar}	30.15	30.15	30.15
?.	Avg. absolute stack temperature, R^o	T_s	697	707	701
13.	Average -\/vel. head, (C_p= .84)	-\/dP	0.81	0.81	0.81
14.	Average stack gas velocity, ft./sec.	V_s	55.02	55.37	55.19
	STACK MOISTURE CONTENT				
15.	Total water collected by train, ml.	V_{ic}	434.60	450.50	437.90
16.	Moisture in stack gas, %	B_{ws}	28.82	29.76	29.04
	EMISSIONS DATA				
17.	Stack gas flow rate, dscf/hr.(000's)	Q_{sd}	1493	1462	1485
18.	Stack gas flow rate, cfm	acfm	45821	46112	45962
19.	Formaldehyde concentration, gr/dscf	C_s	0.0029	0.0034	0.0003
20.	Formaldehyde concentration, lb/hr	E	0.62	0.71	0.06
21.	concentration, lb/mBtu	E'	0.00000	0.00000	0.00000
	ORSAT DATA				
22.	Percent CO_2 by volume	CO_2	2.00	4.30	2.20
3.	Percent O_2 by volume	O_2	17.40	13.30	17.10
24.	Percent CO by volume	CO	.00	.00	.00
25.	Percent N_2 by volume	N_2	80.60	82.40	80.70

Format: summryR3

LEHMAN ROBERTS - FOR NAPA
MEMPHIS, TENNESSEE

Dry Gas Volume

$$V_{m(std)} = V_m \left[\frac{T_{(std)}}{T_m} \right] \left[\frac{P_{bar} + \frac{dH}{13.6}}{P_{(std)}} \right] = 17.64 \frac{^{o}R}{in.Hg} \, Y \, V_m \left[\frac{P_{bar} + \frac{dH}{13.6}}{T_m} \right]$$

Where:

$V_{m(std)}$ = Dry Gas Volume through meter at standard conditions, cu. ft.

V_m = Dry Gas Volume measured by meter, cu. ft.

P_{bar} = Barometric pressure at oriface meter, in. Hg.

P_{std} = Standard absolute pressure,(29.92 in. Hg.).

T_m = Absolute temperature at meter ^{o}R.

T_{std} = Standard absolute temperature ($528^{o}R$).

dH = Average pressure drop across oriface meter, in. H_2O.

Y = Dry gas meter calibration factor.

13.6 = Inches water per inches Hg.

RUN 1:

$$V_{m(std)} = (17.64)(1.011)(\ 51.918) \left[\frac{(30.15) + \frac{1.31}{13.6}}{553} \right] = 50.643 \text{ dscf}$$

RUN 2:

$$V_{m(std)} = (17.64)(1.011)(\ 52.036) \left[\frac{(30.15) + \frac{1.28}{13.6}}{561} \right] = 50.030 \text{ dscf}$$

RUN 3:

$$V_{m(std)} = (17.64)(1.011)(\ 52.728) \left[\frac{(30.15) + \frac{1.30}{13.6}}{565} \right] = 50.339 \text{ dscf}$$

Total Contaminants by Weight: GRAIN LOADING

concentration C_s' gr./dscf.

$$C_s' = \left[0.0154 \frac{gr}{mg} \right] \left[\frac{M_n}{V_{m(std)}} \right]$$

Where:

C_s' = Concentration of formaldehyde in stack gas, dry basis, corrected to standard conditions, gr./dscf.

M_n = Total amount of formaldehyde collected, mg.

$V_{m(std)}$ = Dry gas volume through meter at standard conditions, cu. ft.

Run 1:

$$C_s' = \left[0.0154 \frac{gr}{mg} \right] \left[\frac{9.50}{50.643} \right] = 0.0029 \text{ gr./dscf.}$$

Run 2:

$$C_s' = \left[0.0154 \frac{gr}{mg} \right] \left[\frac{11.00}{50.030} \right] = 0.0034 \text{ gr./dscf.}$$

Run 3:

$$C_s' = \left[0.0154 \frac{gr}{mg} \right] \left[\frac{.94}{50.339} \right] = 0.0003 \text{ gr./dscf.}$$

Dry Molecular Weight

$$M_d = 0.44(\%CO_2) + 0.32(\%O_2) + 0.28(\%CO + \%N_2)$$

Where:

M_d = Dry molecular weight, lb./lb.-mole.

$\%CO_2$ = Percent carbon dioxide by volume (dry basis).

$\%O_2$ = Percent oxygen by volume (dry basis).

$\%N_2$ = Percent nitrogen by volume (dry basis).

%CO = Percent carbon monoxide by volume (dry basis).

0.264 = Ratio of O_2 to N_2 in air, v/v.

0.28 = Molecular weight of N_2 or CO, divided by 100.

0.32 = Molecular weight of O_2 divided by 100.

0.44 = Molecular weight of CO_2 divided by 100.

Run 1:

$$M_d = 0.44(2.00\%) + 0.32(17.40\%) + 0.28(.00\% + 80.60\%) = 29.02 \frac{lb}{lb\text{-}mole}$$

Run 2:

$$M_d = 0.44(4.30\%) + 0.32(13.30\%) + 0.28(.00\% + 82.40\%) = 29.22 \frac{lb}{lb\text{-}mole}$$

Run 3:

$$M_d = 0.44(2.20\%) + 0.32(17.10\%) + 0.28(.00\% + 80.70\%) = 29.04 \frac{lb}{lb\text{-}mole}$$

LEHMAN ROBERTS - FOR NAPA
MEMPHIS, TENNESSEE

Water Vapor Condensed

$$V_{wc_{std}} = \left[V_f - V_i \right] \left[\frac{p_w \; R \; T_{(std)}}{M_w \quad P_{(std)}} \right] = 0.04707 \left[V_f - V_i \right]$$

$$V_{wsg_{std}} = \left[W_f - W_i \right] \left[\frac{R \quad T_{(std)}}{M_w \quad P_{(std)}} \right] = 0.04715 \left[W_f - W_i \right]$$

Where:

0.04707 = Conversion factor, ft.^{3}/ml.

0.04715 = Conversion factor, ft.^{3}/g.

$V_{wc_{std}}$ = Volume of water vapor condensed (standard conditions), scf.

$V_{wsg_{std}}$ = Volume of water vapor collected in silica gel (standard conditions), ml.

$V_f - V_i$ = Final volume of impinger contents less initial volume, ml.

$W_f - W_i$ = Final weight of silica gel less initial weight, g.

p_w = Density of water, 0.002201 lb/ml.

R = Ideal gas constant, 21.85 in.Hg. (cu.ft./lb.-mole)(^oR).

M_w = Molecular weight of water vapor, 18.0 lb/lb-mole.

T_{std} = Absolute temperature at standard conditions, 528^oR.

P_{std} = Absolute pressure at standard conditions, 29.92 inches Hg.

Run 1:

$V_{wc(std)}$ = (0.04707) (416.0) = 19.6 cu.ft
$V_{wsg(std)}$ = (0.04715) (18.6) = 0.9 cu.ft

Run 2:

$V_{wc(std)}$ = (0.04707) (430.0) = 20.2 cu.ft
$V_{wsg(std)}$ = (0.04715) (20.5) = 1.0 cu.ft

Run 3:

$V_{wc(std)}$ = (0.04707) (420.0) = 19.8 cu.ft
$V_{wsg(std)}$ = (0.04715) (17.9) = 0.8 cu.ft

Format: vaporR3

Moisture Content of Stack Gases

$$B_{ws} = \frac{V_{wc_{std}} + V_{wsg_{std}}}{V_{wc_{std}} + V_{wsg_{std}} + V_{m_{std}}} \times 100$$

Where:

B_{ws} = Proportion of water vapor, by volume, in the gas stream.

V_m = Dry gas volume measured by dry gas meter,(dcf).

$V_{wc_{std}}$ = Volume of water vapor condensed corrected to standard conditions (scf).

$V_{wsg_{std}}$ = Volume of water vapor collected in silica gel corrected to standard conditions (scf).

Run 1:

$$B_{ws} = \frac{19.6 + 0.9}{19.6 + 0.9 + 50.643} \text{ X } 100 = 28.82\ \%$$

Run 2:

$$B_{ws} = \frac{20.2 + 1.0}{20.2 + 1.0 + 50.030} \text{ X } 100 = 29.76\ \%$$

Run 3:

$$B_{ws} = \frac{19.8 + 0.8}{19.8 + 0.8 + 50.339} \text{ X } 100 = 29.04\ \%$$

LEHMAN ROBERTS - FOR NAPA
MEMPHIS, TENNESSEE

Moisture Content of Stack Gases

$$B_{ws} = \frac{V_{wc_{std}} + V_{wsg_{std}}}{V_{wc_{std}} + V_{wsg_{std}} + V_{m_{std}}} \times 100$$

Where:

B_{ws} = Proportion of water vapor, by volume, in the gas stream.

V_m = Dry gas volume measured by dry gas meter,(dcf).

$V_{wc_{std}}$ = Volume of water vapor condensed corrected to standard conditions (scf).

$V_{wsg_{std}}$ = Volume of water vapor collected in silica gel corrected to standard conditions (scf).

Run 1:

$$B_{ws} = \frac{19.6 + 0.9}{19.6 + 0.9 + 50.643} \text{ X } 100 = 28.82\ \%$$

Run 2:

$$B_{ws} = \frac{20.2 + 1.0}{20.2 + 1.0 + 50.030} \text{ X } 100 = 29.76\ \%$$

Run 3:

$$B_{ws} = \frac{19.8 + 0.8}{19.8 + 0.8 + 50.339} \text{ X } 100 = 29.04\ \%$$

Molecular Weight of Stack Gases

$$M_s = M_d (1 - B_{ws}) + 18 (B_{ws})$$

Where:

M_s = Molecular weight of stack gas, wet basis, (lb./lb.-mole).

M_d = Molecular weight of stack gas, dry basis, (lb./lb.-mole).

Run 1:

M_s = 29.02 (1 - 28.82) + 18 (28.82) = 25.84 (lb./lb.-mole)

Run 2:

M_s = 29.22 (1 - 29.76) + 18 (29.76) = 25.88 (lb./lb.-mole)

Run 3:

M_s = 29.04 (1 - 29.04) + 18 (29.04) = 25.83 (lb./lb.-mole)

Stack Gas Velocity

$$V_s = K_p\,C_p\left[\sqrt{dP}\right]\text{avg.}\sqrt{\frac{T_{s(avg.)}}{P_s\;M_s}}$$

Where:

V_s = Average velocity of gas stream in stack, ft./sec.

K_p = 85.49 ft/sec $\left[(g/g\text{-mole})\text{-}(mm\ Hg)\ /\ (^{o}K)(mm\ H_2O)\right]^{1/2}$

C_p = Pitot tube coefficient, (dimensionless).

dP = Velocity head of stack gas, in. H_2O.

P_{bar} = Barometric pressure at measurement site, (in. Hg).

P_g = Stack static pressure, (in. Hg).

P_s = Absolute stack gas pressure, (in. Hg) = $P_{bar} + P_g$

P_{std} = Standard absolute pressure, (29.92 in. Hg).

t_s = Stack temperature, (^{o}f).

T_s = Absolute stack temperature, (^{o}R). = 460 + t_s.

M_s = Molecular weight of stack gas, wet basis, (lb/lb-mole).

Run 1:

$$V = (85.49)(.84)(0.81)\sqrt{\frac{697}{(30.15)(25.84)}} = 55.02 \text{ ft/sec.}$$

Run 2:

$$V = (85.49)(.84)(0.81)\sqrt{\frac{707}{(30.15)(25.88)}} = 55.37 \text{ ft/sec.}$$

Run 3:

$$V = (85.49)(.84)(0.81)\sqrt{\frac{701}{(30.15)(25.83)}} = 55.19 \text{ ft/sec.}$$

Stack Gas Flow Rate

$$Q_{sd} = 3600 \left[1 - B_{wc} \right] V_s \; A \left[\frac{T_{std}}{T_{stk}} \right] \left[\frac{P_s}{P_{std}} \right]$$

Where:

Q_{sd} = Dry volumetric stack gas flow rate corrected to standard conditions, (dscf/hr).

A = Cross sectional area of stack, ($ft.^2$).

3600 = Conversion factor, (sec./hr.).

t_s = Stack temperature, (^{o}f).

T_s = Absolute stack temperature, (^{o}R).

T_{std} = Standard absolute temperature, ($528^{o}R$).

P_{bar} = Barometric pressure at measurement site, (in.Hg.).

P_g = Stack static pressure, (in.Hg.).

P_s = Absolute stack gas pressure, (in.Hg.); = $P_{bar} + P_g$

P_{std} = Standard absolute pressure, (29.92 in.Hg.).

Run 1:

$$Q_{sd} = 3600(1- .2882)(55.02)(13.88) \left[\frac{528}{697} \right] \left[\frac{30.15}{29.92} \right] = 1493817.0 \frac{dscf}{hr}$$

Run 2:

$$Q_{sd} = 3600(1- .2976)(55.37)(13.88) \left[\frac{528}{707} \right] \left[\frac{30.15}{29.92} \right] = 1462484.4 \frac{dscf}{hr}$$

Run 3:

$$Q_{sd} = 3600(1- .2904)(55.19)(13.88) \left[\frac{528}{701} \right] \left[\frac{30.15}{29.92} \right] = 1485277.5 \frac{dscf}{hr}$$

Emissions Rate from Stack

$$E = \frac{(C_s)(Q_{sd})}{7000 \text{ gr./lb.}} = \text{lb. / hr.}$$

Where:

E = Emissions rate, lb/hr.

C_s = Concentration of formaldehyde in stack gas, dry basis, corrected to standard conditions, gr/dscf.

Q_{sd} = Dry volumetric stack gas flow rate corrected to standard conditions, dscf/hr.

Run 1:

$$E = \frac{(0.0029)(1493817.0)}{7000} = 0.62 \text{ lb. / hr.}$$

Run 2:

$$E = \frac{(0.0034)(1462484.4)}{7000} = 0.71 \text{ lb. / hr.}$$

Run 3:

$$E = \frac{(0.0003)(1485277.5)}{7000} = 0.06 \text{ lb. / hr.}$$

Isokinetic Variation

$$I = 100\ T_s \left[\frac{0.002669\ V_{ic} + (V_m / T_m)\ (P_{bar} + dH / 13.6)}{60\ \theta\ V_s\ P_s\ A_n} \right]$$

Where:

I	=	Percent isokinetic sampling.
100	=	Conversion to percent.
T_s	=	Absolute average stack gas temperature, ^{o}R.
0.002669	=	Conversion factor, Hg - ft^3/ml - ^{o}R.
V_{ic}	=	Ttl vol of liquid collected in impingers and silica gel, ml.
T_m	=	Absolute average dry gas meter temperature, ^{o}R.
P_{bar}	=	Barometric pressure at sampling site, (in. Hg).
dH	=	Av pressure differential across the oriface meter, (in.H_2O).
13.6	=	Specific gravity of mercury.
60	=	Conversion seconds to minutes.
θ	=	Total sampling time, minutes.
V_s	=	Stack gas velocity, ft./sec.
P_s	=	Absolute stack gas pressure, in. Hg.
A_n	=	Cross sectional area of nozzle, ft^2.

Run 1:

$$I = (100)(\ 697\ ) \left[\frac{(0.002669)(\ 434.6\ ) + \frac{51.918}{553} \boxed{30.15 + \frac{1.31}{13.6}}}{60\ (\ 72.0\ )\ (\ 55.02\ )\ (\ 30.15\ )\ (\ .000398\ )} \right] = 98.5\%$$

Run 2:

$$I = (100)(\ 707\ ) \left[\frac{(0.002669)(\ 450.5) + \frac{52.036}{561} \boxed{30.15 + \frac{1.28}{13.6}}}{60\ (\ 72.0\ )\ (\ 55.37\ )\ (\ 30.15\ )\ (\ .000398\ )} \right] = 99.5\%$$

Run 3:

$$I = (100)(\ 701\ ) \left[\frac{(0.002669)(\ 437.9\ ) + \frac{52.728}{565} \boxed{30.15 + \frac{1.30}{13.6}}}{60\ (\ 72.0\ )\ (\ 55.19\ )\ (\ 30.15\ )\ (\ .000398\ )} \right] = 98.6\%$$

LEHMAN ROBERTS - FOR NAPA
MEMPHIS, TENNESSEE
9-30-91

PERCENT EXCESS AIR

$$\% E_a = \frac{100 \times (\% O_2) - 0.5 (\% CO)}{0.264 (\% N_2) - (\% O_2) + 0.5 (\% CO)}$$

Where: $\%E_a$ = Percent excess air.

$\%O_2$ = Percent oxygen by volume, dry basis.

$\%CO$ = Percent carbon monoxide by volume, dry basis.

$\%CO_2$ = Percent carbon dioxide by volume, dry basis.

$\%N_2$ = Percent nitrogen by volume, dry basis.

Run # 1: $$\frac{100 \times (\% \ 17.40) - .05 (\% \ .00)}{0.264 (\% \ 80.60) - (\% \ 17.40) + 0.5 (\% \ .00)} = 448.6 \%$$

Run # 2: $$\frac{100 \times (\% \ 13.30) - .05 (\% \ .00)}{0.264 (\% \ 82.40) - (\% \ 13.30) + 0.5 (\% \ .00)} = 157.3 \%$$

Run # 3: $$\frac{100 \times (\% \ 17.10) - .05 (\% \ .00)}{0.264 (\% \ 80.70) - (\% \ 17.10) + 0.5 (\% \ .00)} = 406.7 \%$$

Format:ear3

VII. CALCULATIONS

C. PARTICULATE & CONDENSIBLE PM

LEHMAN ROBERTS - FOR NAPA
MPHS, TN PART. (PM) & CONDENSIBLE (CPM)

SUMMARY OF TEST DATA

		9-4-91	9-4-91	9-4-91
		RUN #1	RUN #2	RUN #3
SAMPLING TRAIN DATA				
	start	09:52	11:43	13:29
	finish	10:57	12:48	14:34
1. Sampling time, minutes	Θ	60.0	60.0	60.0
2. Sampling nozzle diameter, in.	D_n	.2500	.2500	.2500
3. Sampling nozzle cross-sect. area, ft^2	A_n	.000341	.000341	.000341
4. Isokinetic variation	I	96.3	114.2	107.0
5. Sample gas volume - meter cond., cf.	V_m	37.235	41.834	41.393
6. Average meter temperature, ^oR	T_m	564	570	575
7. Avg. oriface pressure drop, in. H_2O	dH	1.29	1.58	1.51
8. Total particulate collected, mg.	M_n	14.80	35.00	32.00
VELOCITY TRAVERSE DATA				
9. Stack area, ft^2	A	13.75	13.75	13.75
10. Absolute stack gas pressure, in. Hg.	P_s	30.06	30.06	30.06
11. Barometric pressure, in. Hg.	P_{bar}	30.06	30.06	30.06
12. Avg. absolute stack temperature, R^o	T_s	720	740	740
13. Average $-\sqrt{vel.\ head}$, (C_p= .84)	$-\sqrt{dP}$	0.95	0.93	0.97
14. Average stack gas velocity, ft./sec.	V_s	66.90	67.03	70.50
STACK MOISTURE CONTENT				
15. Total water collected by train, ml.	V_{ic}	514.00	625.00	620.00
16. Moisture in stack gas, %	B_{ws}	41.54	43.69	44.00
EMISSIONS DATA				
17. Stack gas flow rate, dscf/hr.(000's)	Q_{sd}	1426	1339	1400
18. Stack gas flow rate, cfm	acfm	55193	55300	58163
19. Particulate concentration, gr/dscf	C_s	0.0067	0.0142	0.0133
20. Particulate concentration, lb/hr	E	1.37	2.72	2.66
21.				
ORSAT DATA				
22. Percent CO_2 by volume	CO_2	9.20	7.70	4.00
. Percent O_2 by volume	O_2	8.70	5.00	3.20
24. Percent CO by volume	CO	.00	.00	.00
25. Percent N_2 by volume	N_2	82.10	87.30	92.80

Format: summryR3

LEHMAN ROBERTS - FOR NAPA
MPHS, TN PART. (PM) & CONDENSIBLE (CPM)

Dry Gas Volume

$$V_{m(std)} = V_m \left[\frac{T_{(std)}}{T_m}\right]\left[\frac{P_{bar} + \frac{dH}{13.6}}{P_{(std)}}\right] = 17.64 \frac{^oR}{in.Hg}\, Y\, V_m \left[\frac{P_{bar} + \frac{dH}{13.6}}{T_m}\right]$$

Where:

$V_{m(std)}$ = Dry Gas Volume through meter at standard conditions, cu. ft.

V_m = Dry Gas Volume measured by meter, cu. ft.

P_{bar} = Barometric pressure at oriface meter, in. Hg.

P_{std} = Standard absolute pressure,(29.92 in. Hg.).

T_m = Absolute temperature at meter ^oR.

T_{std} = Standard absolute temperature (528^oR).

dH = Average pressure drop across oriface meter, in. H_2O.

Y = Dry gas meter calibration factor.

13.6 = Inches water per inches Hg.

RUN 1:

$$V_{m(std)} = (17.64)(\ .970)(\ 37.235)\left[\frac{(30.06) + \frac{1.29}{13.6}}{564}\right] = 34.064 \text{ dscf}$$

0.9647125

RUN 2:

$$V_{m(std)} = (17.64)(\ .970)(\ 41.834)\left[\frac{(30.06) + \frac{1.58}{13.6}}{570}\right] = 37.896 \text{ dscf}$$

RUN 3:

$$V_{m(std)} = (17.64)(\ .970)(\ 41.393)\left[\frac{(30.06) + \frac{1.51}{13.6}}{575}\right] = 37.164 \text{ dscf}$$

Format: dgmR3

LEHMAN ROBERTS - FOR NAPA
MPHS, TN PART. (PM) & CONDENSIBLE (CPM)

Total Contaminants by Weight: GRAIN LOADING

Particulate concentration C_s' gr./dscf.

$$C_s' = \left[0.0154 \frac{gr}{mg}\right] \left[\frac{M_n}{V_{m(std)}}\right]$$

Where:

C_s' = Concentration of particulate matter in stack gas, dry basis, corrected to standard conditions, gr./dscf.

M_n = Total amount of particulate matter collected, mg.

$V_{m(std)}$ = Dry gas volume through meter at standard conditions, cu. ft.

Run 1:

$$C_s' = \left[0.0154 \frac{gr}{mg}\right] \left[\frac{14.80}{34.064}\right] = 0.0067 \text{ gr./dscf.}$$

Run 2:

$$C_s' = \left[0.0154 \frac{gr}{mg}\right] \left[\frac{35.00}{37.896}\right] = 0.0142 \text{ gr./dscf.}$$

Run 3:

$$C_s' = \left[0.0154 \frac{gr}{mg}\right] \left[\frac{32.00}{37.164}\right] = 0.0133 \text{ gr./dscf.}$$

Total Contaminants by Weight: GRAIN LOADING

(CPM)

Particulate concentration C_s' gr./dscf.

$$C_s' = \left[0.0154 \frac{gr}{mg} \right] \left[\frac{M_n}{V_{m(std)}} \right]$$

Where:

C_s' = Concentration of particulate matter in stack gas, dry basis, corrected to standard conditions,gr./dscf.

M_n = Total amount of particulate matter collected, mg.

$V_{m(std)}$ = Dry gas volume through meter at standard conditions, cu. ft.

Run 1:

$$C_s' = \left[0.0154 \frac{gr}{mg} \right] \left[\frac{5.20}{34.064} \right] = 0.0024 \text{ gr./dscf.}$$

Run 2:

$$C_s' = \left[0.0154 \frac{gr}{mg} \right] \left[\frac{5.10}{37.896} \right] = 0.0021 \text{ gr./dscf.}$$

Run 3:

$$C_s' = \left[0.0154 \frac{gr}{mg} \right] \left[\frac{3.20}{37.164} \right] = 0.0013 \text{ gr./dscf.}$$

Dry Molecular Weight

$$M_d = 0.44(\%CO_2) + 0.32(\%O_2) + 0.28(\%CO + \%N_2)$$

Where:

M_d = Dry molecular weight, lb./lb.-mole.

$\%CO_2$ = Percent carbon dioxide by volume (dry basis).

$\%O_2$ = Percent oxygen by volume (dry basis).

$\%N_2$ = Percent nitrogen by volume (dry basis).

$\%CO$ = Percent carbon monoxide by volume (dry basis).

0.264 = Ratio of O_2 to N_2 in air, v/v.

0.28 = Molecular weight of N_2 or CO, divided by 100.

0.32 = Molecular weight of O_2 divided by 100.

0.44 = Molecular weight of CO_2 divided by 100.

Run 1:

$$M_d = 0.44(\ 9.20\%) + 0.32(\ 8.70\%) + 0.28(\ .00\% + 82.10\%) = 29.82\ \frac{lb}{lb\text{-}mole}$$

Run 2:

$$M_d = 0.44(\ 7.70\%) + 0.32(\ 5.00\%) + 0.28(\ .00\% + 87.30\%) = 29.43\ \frac{lb}{lb\text{-}mole}$$

Run 3:

$$M_d = 0.44(\ 4.00\%) + 0.32(\ 3.20\%) + 0.28(\ .00\% + 92.80\%) = 28.77\ \frac{lb}{lb\text{-}mole}$$

Water Vapor Condensed

$$V_{wc_{std}} = \left[V_f - V_i \right] \left[\frac{p_w \; R \; T_{(std)}}{M_w \; P_{(std)}} \right] = 0.04707 \left[V_f - V_i \right]$$

$$V_{wsg_{std}} = \left[W_f - W_i \right] \left[\frac{R \; T_{(std)}}{M_w \; P_{(std)}} \right] = 0.04715 \left[W_f - W_i \right]$$

Where:

0.04707 = Conversion factor, $ft.^3/ml.$

0.04715 = Conversion factor, $ft.^3/g.$

$V_{wc_{std}}$ = Volume of water vapor condensed (standard conditions), scf.

$V_{wsg_{std}}$ = Volume of water vapor collected in silica gel (standard conditions), ml.

$V_f - V_i$ = Final volume of impinger contents less initial volume, ml.

$W_f - W_i$ = Final weight of silica gel less initial weight, g.

p_w = Density of water, 0.002201 lb/ml.

R = Ideal gas constant, 21.85 in.Hg. (cu.ft./lb.-mole)(^oR).

M_w = Molecular weight of water vapor, 18.0 lb/lb-mole.

T_{std} = Absolute temperature at standard conditions, 528^oR.

P_{std} = Absolute pressure at standard conditions, 29.92 inches Hg.

Run 1:

$V_{wc(std)}$ = (0.04707) (492.0) = 23.2 cu.ft
$V_{wsg(std)}$ = (0.04715) (22.0) = 1.0 cu.ft

Run 2:

$V_{wc(std)}$ = (0.04707) (595.0) = 28.0 cu.ft
$V_{wsg(std)}$ = (0.04715) (30.0) = 1.4 cu.ft

Run 3:

$V_{wc(std)}$ = (0.04707) (590.0) = 27.8 cu.ft
$V_{wsg(std)}$ = (0.04715) (30.0) = 1.4 cu.ft

LEHMAN ROBERTS - FOR NAPA
MPHS, TN PART. (PM) & CONDENSIBLE (CPM)

Moisture Content of Stack Gases

$$B_{ws} = \frac{V_{wc_{std}} + V_{wsg_{std}}}{V_{wc_{std}} + V_{wsg_{std}} + V_{m_{std}}} \times 100$$

Where:

B_{ws} = Proportion of water vapor, by volume, in the gas stream.

V_m = Dry gas volume measured by dry gas meter,(dcf).

$V_{wc_{std}}$ = Volume of water vapor condensed corrected to standard conditions (scf).

$V_{wsg_{std}}$ = Volume of water vapor collected in silica gel corrected to standard conditions (scf).

Run 1:

$$B_{ws} = \frac{23.2 + 1.0}{23.2 + 1.0 + 34.064} \times 100 = 41.54\ \%$$

Run 2:

$$B_{ws} = \frac{28.0 + 1.4}{28.0 + 1.4 + 37.896} \times 100 = 43.69\ \%$$

Run 3:

$$B_{ws} = \frac{27.8 + 1.4}{27.8 + 1.4 + 37.164} \times 100 = 44.00\ \%$$

Format: bwsR3

Molecular Weight of Stack Gases

$$M_s = M_d (1 - B_{ws}) + 18 (B_{ws})$$

Where:

M_s = Molecular weight of stack gas, wet basis, (lb./lb.-mole).

M_d = Molecular weight of stack gas, dry basis, (lb./lb.-mole).

Run 1:

$$M_s = 29.82 (1 - 41.54) + 18 (41.54) = 24.91 \text{ (lb./lb.-mole)}$$

Run 2:

$$M_s = 29.43 (1 - 43.69) + 18 (43.69) = 24.44 \text{ (lb./lb.-mole)}$$

Run 3:

$$M_s = 28.77 (1 - 44.00) + 18 (44.00) = 24.03 \text{ (lb./lb.-mole)}$$

Stack Gas Velocity

$$V_s = K_p C_p \left[\sqrt{dP} \right] \text{avg.} \sqrt{\frac{T_{s(avg.)}}{P_s \, M_s}}$$

Where:

V_s = Average velocity of gas stream in stack, ft./sec.

K_p = 85.49 ft/sec $\left[(g/g\text{-mole})\text{-}(mm\ Hg) \,/\, (^{\circ}K)(mm\ H_2O) \right]^{1/2}$

C_p = Pitot tube coefficient, (dimensionless).

dP = Velocity head of stack gas, in. H_2O.

P_{bar} = Barometric pressure at measurement site, (in. Hg).

P_g = Stack static pressure, (in. Hg).

P_s = Absolute stack gas pressure, (in. Hg) = $P_{bar} + P_g$

P_{std} = Standard absolute pressure, (29.92 in. Hg).

t_s = Stack temperature, ($^{\circ}$f).

T_s = Absolute stack temperature, ($^{\circ}$R). = 460 + t_s.

M_s = Molecular weight of stack gas, wet basis, (lb/lb-mole).

Run 1:

$$V = (85.49)(.84)(0.95)\sqrt{\frac{720}{(30.06)(24.91)}} = 66.90 \text{ ft/sec.}$$

Run 2:

$$V = (85.49)(.84)(0.93)\sqrt{\frac{740}{(30.06)(24.44)}} = 67.03 \text{ ft/sec.}$$

Run 3:

$$V = (85.49)(.84)(0.97)\sqrt{\frac{740}{(30.06)(24.03)}} = 70.50 \text{ ft/sec.}$$

Stack Gas Flow Rate

$$Q_{sd} = 3600 \left[1 - B_{wc} \right] V_s \; A \left[\frac{T_{std}}{T_{stk}} \right] \left[\frac{P_s}{P_{std}} \right]$$

Where:

Q_{sd} = Dry volumetric stack gas flow rate corrected to standard conditions, (dscf/hr).

A = Cross sectional area of stack, (ft.^{2}).

3600 = Conversion factor, (sec./hr.).

t_s = Stack temperature, (^{o}f).

T_s = Absolute stack temperature, (^{o}R).

T_{std} = Standard absolute temperature, (528^{o}R).

P_{bar} = Barometric pressure at measurement site, (in.Hg.).

P_g = Stack static pressure, (in.Hg.).

P_s = Absolute stack gas pressure, (in.Hg.); = $P_{bar} + P_g$

P_{std} = Standard absolute pressure, (29.92 in.Hg.).

Run 1:

$$Q_{sd} = 3600(1- \quad .4154 \quad)(\ 66.90)(\ 13.75) \left[\frac{528}{720} \right] \left[\frac{30.06}{29.92} \right] = 1426326.5 \ \frac{dscf}{hr}$$

Run 2:

$$Q_{sd} = 3600(1- \quad .4369 \quad)(\ 67.03)(\ 13.75) \left[\frac{528}{740} \right] \left[\frac{30.06}{29.92} \right] = 1339336.0 \ \frac{dscf}{hr}$$

Run 3:

$$Q_{sd} = 3600(1- \quad .4400 \quad)(\ 70.50)(\ 13.75) \left[\frac{528}{740} \right] \left[\frac{30.06}{29.92} \right] = 1400915.5 \ \frac{dscf}{hr}$$

Emissions Rate from Stack

$$E = \frac{(C_s)(Q_{sd})}{7000\ \text{gr./lb.}} = \text{lb. / hr.}$$

Where:

E = Emissions rate, lb/hr.

C_s = Concentration of particulate matter in stack gas, dry basis, corrected to standard conditions, gr/dscf.

Q_{sd} = Dry volumetric stack gas flow rate corrected to standard conditions, dscf/hr.

Run 1:

$$E = \frac{(0.0067)(1426326.5)}{7000} = 1.37\ \text{lb. / hr.}$$

Run 2:

$$E = \frac{(0.0142)(1339336.0)}{7000} = 2.72\ \text{lb. / hr.}$$

Run 3:

$$E = \frac{(0.0133)(1400915.5)}{7000} = 2.66\ \text{lb. / hr.}$$

Emissions Rate from Stack
(CPM)

$$E = \frac{(C_s)(Q_{sd})}{7000 \text{ gr./lb.}} = \text{lb. / hr.}$$

Where:

E = Emissions rate, lb/hr.

C_s = Concentration of particulate matter in stack gas, dry basis, corrected to standard conditions, gr/dscf.

Q_{sd} = Dry volumetric stack gas flow rate corrected to standard conditions, dscf/hr.

Run 1:

$$E = \frac{(0.0024)(1426326.5)}{7000} = 0.49 \text{ lb. / hr.}$$

Run 2:

$$E = \frac{(0.0021)(1339336.0)}{7000} = 0.40 \text{ lb. / hr.}$$

Run 3:

$$E = \frac{(0.0013)(1400915.5)}{7000} = 0.26 \text{ lb. / hr.}$$

LEHMAN ROBERTS - FOR NAPA
MPHS, TN PART. (PM) & CONDENSIBLE (CPM)

Isokinetic Variation

$$I = 100 \; T_s \left[\frac{0.002669 \; V_{ic} + (V_m / T_m) \; (P_{bar} + dH / 13.6)}{60 \quad \theta \quad V_s \quad P_s \quad A_n} \right]$$

Where:

I	=	Percent isokinetic sampling.
100	=	Conversion to percent.
T_s	=	Absolute average stack gas temperature, ^oR.
0.002669	=	Conversion factor, Hg - ft^3/ml - ^oR.
V_{ic}	=	Ttl vol of liquid collected in impingers and silica gel, ml.
T_m	=	Absolute average dry gas meter temperature, ^oR.
P_{bar}	=	Barometric pressure at sampling site, (in. Hg).
dH	=	Av pressure differential across the oriface meter, (in.H_2O).
13.6	=	Specific gravity of mercury.
60	=	Conversion seconds to minutes.
θ	=	Total sampling time, minutes.
V_s	=	Stack gas velocity, ft./sec.
P_s	=	Absolute stack gas pressure, in. Hg.
A_n	=	Cross sectional area of nozzle, ft^2.

Run 1:

$$I = (100)(\;720\;) \left[\frac{(0.002669)(******) + \frac{37.235}{564} \boxed{30.06 + \frac{1.29}{13.6}}}{60\;(\;60.0\;)\;(\;66.90\;)\;(\;30.06\;)\;(\;.000341\;)} \right] = 96.3\%$$

Run 2:

$$I = (100)(\;740\;) \left[\frac{(0.002669)(******) + \frac{41.834}{570} \boxed{30.06 + \frac{1.58}{13.6}}}{60\;(\;60.0\;)\;(\;67.03\;)\;(\;30.06\;)\;(\;.000341\;)} \right] = 114.2\%$$

Run 3:

$$I = (100)(\;740\;) \left[\frac{(0.002669)(******) + \frac{41.393}{575} \boxed{30.06 + \frac{1.51}{13.6}}}{60\;(\;60.0\;)\;(\;70.50\;)\;(\;30.06\;)\;(\;.000341\;)} \right] = 107.0\%$$

Format: iR3

$$\% E_a = \frac{100 \times (\% O_2) - 0.5 (\% CO)}{0.264 (\% N_2) - (\% O_2) + 0.5 (\% CO)}$$

Where: $\%E_a$ = Percent excess air.

$\%O_2$ = Percent oxygen by volume, dry basis.

$\%CO$ = Percent carbon monoxide by volume, dry basis.

$\%CO_2$ = Percent carbon dioxide by volume, dry basis.

$\%N_2$ = Percent nitrogen by volume, dry basis.

Run # 1: $$\frac{100 \times (\% \; 8.70) - .05 (\% \; .00)}{0.264 (\% \; 82.10) - (\% \; 8.70) + 0.5 (\% \; .00)} = 67.1 \%$$

Run # 2: $$\frac{100 \times (\% \; 5.00) - .05 (\% \; .00)}{0.264 (\% \; 87.30) - (\% \; 5.00) + 0.5 (\% \; .00)} = 27.7 \%$$

Run # 3: $$\frac{100 \times (\% \; 3.20) - .05 (\% \; .00)}{0.264 (\% \; 92.80) - (\% \; 3.20) + 0.5 (\% \; .00)} = 15.0 \%$$

VII. CALCULATIONS

D. GASEOUS POLLUTANTS

NAME: LEHMAN ROBERTS (NAPA) DATE: 9-03-91
LOCATION: MEMPHIS, TENNESSEE

TOTAL HYDROCARBON EMISSIONS: Convert ppm (wet) to ppm (dry)

$$ppm_d - ppm_w \left(\frac{100}{100 - B_{ws}}\right)$$

Where: ppm_d = Parts per million, dry basis.

ppm_w = Parts per million, wet basis (as measured by the instrument).

B_{ws} = Proportion of water vapor, by volume, in the gas stream.

Run #1:

$$THC - (124.4) \left(\frac{100}{100 - 46.21}\right) - 231.3\ ppm_d$$

Run #2:

$$THC - (143.6) \left(\frac{100}{100 - 43.03}\right) - 252.1\ ppm_d$$

Run #3:

$$THC - (192.2) \left(\frac{100}{100 - 42.63}\right) - 335.0\ ppm_d$$

NAME: LEHMAN ROBERTS (NAPA) DATE: 9-03-91
LOCATION: MEMPHIS, TENNESSEE

TOTAL HYDROCARBON EMISSIONS: POUNDS PER HOUR

$$E - (2.59 \times 10^{-9})\ (M_d)\ (ppm_d)\ (Q_{sd})$$

Where:

E = Total Hydrocarbon emissions rate, lbs/hr.

2.59×10^{-9} = Conversion factor, lbs/dscf.

M_d = Dry molecular weight.

Q_{sd} = Dry volumetric stack gas flow rate corrected to std. conditions, dscf/hr.

ppm_d = Parts per million, dry basis.

Run #1:

$$E - (2.59 \times 10^{-9})\ (16.04)\ (231.3)\ (1{,}254{,}491.3) - 12.05\ \frac{lbs}{hr}\ \text{as methane}$$

Run #2:

$$E - (2.59 \times 10^{-9})\ (16.04)\ (252.1)\ (1{,}410{,}621.9) - 14.77\ \frac{lbs}{hr}\ \text{as methane}$$

Run 3:

$$E - (2.59 \times 10^{-9})\ (16.04)\ (335.0)\ (1{,}463{,}169.4) - 20.36\ \frac{lbs}{hr}\ \text{as methane}$$

NAME: LEHMAN ROBERTS (NAPA) DATE: 9-03-91
LOCATION: MEMPHIS, TENNESSEE

TOTAL SO_2 EMISSIONS: POUNDS PER HOUR

$$E - (2.59\times10^{-}9)\ (M_d)\ (ppm_d)\ (Q_{sd})$$

Where: E = Sulfur dioxide emissions rate, lbs/hr.

2.59×10^{-9} = Conversion factor, lbs/dscf.

M_d = Dry molecular weight.

Q_{sd} = Dry volumetric stack gas flow rate corrected to std. conditions, dscf/hr.

ppm_d = Parts per million, dry basis.

Run #1:

$$E - (2.59\times10^{-}9)\ (64.07)\ (1.6)\ (1{,}254{,}491.3) - 0.33\ \frac{lbs}{hr}$$

Run #2:

$$E - (2.59\times10^{-}9)\ (64.07)\ (2.3)\ (1{,}410{,}621.9) - 0.54\ \frac{lbs}{hr}$$

Run 3:

$$E - (2.59\times10^{-}9)\ (64.07)\ (2.0)\ (1{,}463{,}169.4) - 0.49\ \frac{lbs}{hr}$$

NAME: LEHMAN ROBERTS (NAPA) DATE: 9-03-91
LOCATION: MEMPHIS, TENNESSEE

TOTAL CARBON MONOXIDE EMISSIONS: POUNDS PER HOUR

$$E - (2.59 \times 10^{-}9)\ (M_d)\ (ppm_d)\ (Q_{sd})$$

Where: E = Carbon Monoxide emissions rate, lbs/hr.

2.59×10^{-9} = Conversion factor, lbs/dscf.

M_d = Dry molecular weight.

Q_{sd} = Dry volumetric stack gas flow rate corrected to std. conditions, dscf/hr.

ppm_d = Parts per million, dry basis.

Run #1:

$$E - (2.59 \times 10^{-}9)\ (28.01)\ (>1{,}000)\ (1{,}254{,}491.3) - >91.01\ \frac{lbs}{hr}$$

Run #2:

$$E - (2.59 \times 10^{-}9)\ (28.01)\ (>1{,}000)\ (1{,}410{,}621.9) - >102.33\ \frac{lbs}{hr}$$

Run 3:

$$E - (2.59 \times 10^{-}9)\ (28.01)\ (>1{,}000)\ (1{,}463{,}169.4) - >106.15\ \frac{lbs}{hr}$$

NAME: LEHMAN ROBERTS (NAPA) DATE: 9-03-91
LOCATION: MEMPHIS, TENNESSEE

TOTAL NO_x EMISSIONS: POUNDS PER HOUR

$$E - (2.59 \times 10^{-9})\ (M_d)\ (ppm_d)\ (Q_{sd})$$

Where: E = Nitrogen oxide emissions rate, lbs/hr.

2.59×10^{-9} = Conversion factor, lbs/dscf.

M_d = Dry molecular weight.

Q_{sd} = Dry volumetric stack gas flow rate corrected to std. conditions, dscf/hr.

ppm_d = Parts per million, dry basis.

Run #1:

$$E - (2.59 \times 10^{-9})\ (46.01)\ (45.6)\ (1{,}254{,}491.3) - 6.82\ \frac{lbs}{hr}$$

Run #2:

$$E - (2.59 \times 10^{-9})\ (46.01)\ (37.6)\ (1{,}410{,}621.9) - 6.32\ \frac{lbs}{hr}$$

Run 3:

$$8E - (2.59 \times 10^{-9})\ (46.01)\ (39.3)\ (1{,}463{,}169.4) - 6.85\ \frac{lbs}{hr}$$

VIII. FIELD DATA

A. INSTRUMENTAL

LEHMAN ROBERTS

RUN # 1 DATA LISTING

NAME: RAMCON ENVIRONMENTAL LOCATION: LEHMAN ROBERTS

CHAN NAME		HC	SO2	CO2	CO	O2	NOx
CHAN UNITS		ppm	ppm	%	ppm	%	ppm
FULL SCALE		1000.0	100.0	20.0	1000.0	25.0	100
ZERO OFFSET		0.0	0.0	0.0	0.0	0.0	0
START / CHANNEL		01	02	03	04	05	06
09/03/91	11:25	99.5	0.8	7.2	1013.0	9.0	50
09/03/91	11:26	93.5	1.0	7.2	1023.5	8.7	48
09/03/91	11:27	95.5	1.1	7.3	1023.5	8.6	47
09/03/91	11:28	100.0	1.3	7.4	1023.5	8.5	48
09/03/91	11:29	98.5	1.3	7.3	1023.5	8.5	49
09/03/91	11:30	95.5	1.3	7.2	1023.5	8.7	48
09/03/91	11:31	95.0	1.2	7.3	1023.5	8.5	48
09/03/91	11:32	98.0	1.2	7.4	1023.5	8.3	48
09/03/91	11:33	107.0	1.3	7.5	1023.5	8.2	49
09/03/91	11:34	96.0	0.9	7.4	1023.5	8.3	49
09/03/91	11:35	103.5	1.1	7.5	1023.5	8.2	48
09/03/91	11:36	102.5	1.1	7.4	1023.5	8.2	48
09/03/91	11:37	108.0	1.2	7.4	1023.5	8.1	47
09/03/91	11:38	114.5	1.4	7.4	1023.5	7.9	45
09/03/91	11:39	110.0	1.4	7.5	1023.5	7.9	44
09/03/91	11:40	107.5	1.1	7.7	1023.5	7.8	47
09/03/91	11:41	87.5	1.2	7.8	1023.5	7.5	48
09/03/91	11:42	129.5	1.4	7.8	1023.5	7.2	46
09/03/91	11:43	103.5	1.3	7.8	1023.5	7.2	46
09/03/91	11:44	95.0	0.9	7.8	1023.5	7.5	50
09/03/91	11:45	102.0	1.1	7.8	1023.5	7.4	49
09/03/91	11:46	98.5	1.0	7.8	1023.5	7.5	49
09/03/91	11:47	103.0	1.0	7.8	1023.5	7.5	49
09/03/91	11:48	102.0	1.1	7.8	1023.5	7.4	49
09/03/91	11:49	115.5	1.0	7.7	1023.5	7.4	47
09/03/91	11:50	111.0	1.5	7.7	1023.5	7.3	45
09/03/91	11:51	105.0	1.0	7.7	1023.5	7.4	45
09/03/91	11:52	110.5	1.2	7.7	1023.5	7.3	46
09/03/91	11:53	102.0	0.8	7.8	1023.5	7.5	48
09/03/91	11:54	95.5	0.8	7.8	1023.5	7.5	49
09/03/91	11:55	112.0	1.0	7.8	1023.5	7.4	49
09/03/91	11:56	97.0	1.1	7.0	1023.5	8.2	45
09/03/91	11:57	90.0	0.8	7.3	1023.5	8.5	46
09/03/91	11:58	100.5	1.0	7.4	1023.5	8.2	47
09/03/91	11:59	371.0	4.9	7.3	1023.5	7.7	39
09/03/91	12:00	124.5	7.1	7.4	1023.5	7.4	35
09/03/91	12:01	221.5	2.7	7.4	1023.5	7.6	40
09/03/91	12:02	132.0	3.7	7.7	1023.5	7.3	38
09/03/91	12:03	176.0	2.9	8.0	1023.5	6.5	41
09/03/91	12:04	107.0	2.2	8.1	1023.5	6.4	43
09/03/91	12:05	111.5	1.0	8.1	1023.5	6.4	47
09/03/91	12:06	117.0	1.3	8.1	1023.5	6.3	45

LEHMAN ROBERTS

RUN # 1 DATA LISTING

NAME: RAMCON ENVIRONMENTAL LOCATION: LEHMAN ROBERTS

CHAN NAME		HC	SO2	CO2	CO	O2	NOx
CHAN UNITS		ppm	ppm	%	ppm	%	ppm
FULL SCALE		1000.0	100.0	20.0	1000.0	25.0	100
ZERO OFFSET		0.0	0.0	0.0	0.0	0.0	0
START / CHANNEL		01	02	03	04	05	06
09/03/91	12:07	116.5	0.9	8.1	1023.5	6.5	48
09/03/91	12:08	125.0	0.9	8.2	1023.5	6.6	50
09/03/91	12:09	111.5	1.1	8.1	1023.5	6.3	46
09/03/91	12:10	124.5	1.7	8.0	1023.5	6.2	44
09/03/91	12:11	143.5	1.8	7.7	1023.5	6.8	42
09/03/91	12:12	138.0	1.9	7.7	1023.5	7.0	41
09/03/91	12:13	136.5	2.0	8.1	1023.5	6.5	43
09/03/91	12:14	137.0	1.5	8.1	1023.5	6.3	44
09/03/91	12:15	147.0	1.6	8.1	1023.5	6.3	44
09/03/91	12:16	139.0	1.9	8.1	1023.5	6.3	44
09/03/91	12:17	131.5	1.4	8.1	1023.5	6.4	46
09/03/91	12:18	218.5	2.6	8.0	1023.5	6.3	43
09/03/91	12:19	231.0	5.5	8.0	1023.5	6.1	38
09/03/91	12:20	136.0	2.8	8.0	1023.5	6.2	42
09/03/91	12:21	155.5	2.0	8.1	1023.5	6.2	43
09/03/91	12:22	158.0	2.2	8.1	1023.5	6.2	43
09/03/91	12:23	130.5	1.5	8.1	1023.5	6.3	45
09/03/91	12:24	131.0	1.3	8.1	1023.5	6.3	47
09/03/91	12:25	135.0	1.3	8.1	1023.5	6.3	46
Averages:		124.4	1.6	7.7	>1000.0	7.3	45.6

LEHMAN ROBERTS

RUN # 2 DATA LISTING

NAME: RAMCON ENVIRONMENTAL LOCATION: LEHMAN ROBERTS

CHAN NAME		HC	SO2	CO2	CO	O2	NOx
CHAN UNITS		ppm	ppm	%	ppm	%	ppm
FULL SCALE		1000.0	100.0	20.0	1000.0	25.0	100
ZERO OFFSET		0.0	0.0	0.0	0.0	0.0	0
START / CHANNEL		01	02	03	04	05	06
09/03/91	14:25	117.0	1.2	6.8	1023.5	8.8	39
09/03/91	14:26	116.0	1.3	6.7	1023.5	8.8	38
09/03/91	14:27	109.0	1.1	6.8	1023.5	8.7	38
09/03/91	14:28	129.0	1.4	6.7	1023.5	8.7	37
09/03/91	14:29	126.0	1.6	6.8	1023.5	8.7	36
09/03/91	14:30	124.5	1.4	6.8	1023.5	8.7	37
09/03/91	14:31	126.5	1.8	7.2	1023.5	8.1	38
09/03/91	14:32	135.0	1.7	7.2	1023.5	7.9	39
09/03/91	14:33	122.5	1.8	7.2	1023.5	7.9	38
09/03/91	14:34	133.0	1.7	7.2	1023.5	7.9	38
09/03/91	14:35	125.0	1.8	7.2	1023.5	7.9	39
09/03/91	14:36	115.5	1.6	7.1	1023.5	7.9	39
09/03/91	14:37	104.0	1.2	7.1	1023.5	8.1	40
09/03/91	14:38	126.0	1.3	7.2	1023.5	8.0	40
09/03/91	14:39	139.0	1.8	7.1	1023.5	8.0	38
09/03/91	14:40	126.5	1.5	7.1	1023.5	8.0	39
09/03/91	14:41	150.5	1.9	7.2	1023.5	7.9	38
09/03/91	14:42	151.0	2.4	7.1	1023.5	7.8	37
09/03/91	14:43	120.5	1.9	7.2	1023.5	7.9	38
09/03/91	14:44	126.5	1.8	7.2	1023.5	8.0	38
09/03/91	14:45	125.5	1.4	7.2	1023.5	7.9	39
09/03/91	14:46	109.5	1.3	7.2	1023.5	7.9	40
09/03/91	14:47	107.5	1.3	7.1	1023.5	7.9	39
09/03/91	14:48	111.0	1.0	7.2	1023.5	8.0	40
09/03/91	14:49	98.5	0.8	7.2	1023.5	8.1	42
09/03/91	14:50	108.0	1.1	7.2	1023.5	8.1	41
09/03/91	14:51	107.5	0.9	7.2	1023.5	8.1	41
09/03/91	14:52	102.5	0.7	7.1	1023.5	8.3	43
09/03/91	14:53	102.5	0.9	7.2	1023.5	8.3	44
09/03/91	14:54	163.0	1.6	7.2	1023.5	8.0	40
09/03/91	14:55	156.0	2.9	7.2	1023.5	7.8	36
09/03/91	14:56	127.5	1.5	7.2	1023.5	7.9	40
09/03/91	14:57	108.5	1.8	7.2	1023.5	7.9	38
09/03/91	14:58	129.5	2.0	7.1	1023.5	7.9	37
09/03/91	14:59	428.0	5.7	7.1	1023.5	7.8	34
09/03/91	15:00	452.0	14.0	7.0	1023.5	7.6	27
09/03/91	15:01	211.5	7.1	7.1	1023.5	7.7	30
09/03/91	15:02	144.5	2.8	7.1	1023.5	7.8	35
09/03/91	15:03	115.0	1.3	7.2	1023.5	7.9	38
09/03/91	15:04	118.5	1.5	7.2	1023.5	7.9	39
09/03/91	15:05	121.0	1.5	7.2	1023.5	7.9	39
09/03/91	15:06	146.0	2.0	7.2	1023.5	7.8	38
09/03/91	15:07	166.0	3.0	7.1	1023.5	7.7	36

LEHMAN ROBERTS

RUN # 2 DATA LISTING

.AME: RAMCON ENVIRONMENTAL LOCATION: LEHMAN ROBERTS

CHAN NAME		HC	SO2	CO2	CO	O2	NOx
CHAN UNITS		ppm	ppm	%	ppm	%	ppm
FULL SCALE		1000.0	100.0	20.0	1000.0	25.0	100
ZERO OFFSET		0.0	0.0	0.0	0.0	0.0	0
START / CHANNEL		01	02	03	04	05	06
09/03/91	15:08	142.0	2.6	7.1	1023.5	7.7	36
09/03/91	15:09	137.0	1.7	7.1	1023.5	7.8	38
09/03/91	15:10	156.0	2.3	7.1	1023.5	7.9	37
09/03/91	15:11	189.0	3.7	7.1	1023.5	7.7	35
09/03/91	15:12	160.0	3.3	7.1	1023.5	7.7	35
09/03/91	15:13	162.0	2.7	7.1	1023.5	7.7	36
09/03/91	15:14	151.0	3.3	7.1	1023.5	7.7	35
09/03/91	15:15	156.5	3.2	7.1	1023.5	7.7	35
09/03/91	15:16	133.5	2.8	7.2	1023.5	7.7	36
09/03/91	15:17	154.5	2.5	7.2	1023.5	7.6	37
09/03/91	15:18	213.0	3.6	7.2	1023.5	7.6	35
09/03/91	15:19	157.5	3.6	7.1	1023.5	7.6	34
09/03/91	15:20	144.0	2.6	7.1	1023.5	7.7	37
09/03/91	15:21	128.5	1.9	7.1	1023.5	7.8	38
09/03/91	15:22	117.0	1.9	7.1	1023.5	7.8	38
09/03/91	15:23	123.0	1.7	7.2	1023.5	7.8	38
09/03/91	15:24	134.0	1.8	7.2	1023.5	7.7	38
9/03/91	15:25	120.5	2.0	7.2	1023.5	7.7	38
Averages:		143.6	2.3	7.1	>1000.0	7.9	37.6

VIII. FIELD DATA

B. GAS CHROMATOGRAPHY

FIELD ANALYSIS DATA SHEETS

Plant Lehman Roberts Date 9-3-91

Location Mphs, TN

1. General Information:

Source temp. (°C)	121	Columnar temperature:	
Probe temp. (°C)	121	Initial (°C)/time (min)	75
Ambient temp. (°C)	32	Program rate (°C/min)	–
Atmospheric press. (in. Hg)	30.01	Final (°C)/time (min)	75
Source press. (in. Hg)		Carrier gas flow rate (ml/min)	30
Absolute source press. (mm)		Detector temperature (°C)	
Sampling rate (liter/min)	1	Injection time (24-hr basis)	
Sample loop volume (ml)	1	Chart speed (mm/min)	
Sample loop temp. (°C)	75	Dilution ratio	
Dilution gas flow rate (ml/min)		Dilution gas used (symbol)	

2. Field Analysis Data: 11:30 – 12:30

Run # 1A Time

Components	Area	Attenuation	A x A Factor	Concentration (ppm)
Methane				BDL
B				"
T				"
E				"
X				"

Run # 1B Time

Components	Area	Attenuation	A x A Factor	Concentration (ppm)
M				BDL
B				"
T				"
E				"
X				"

Run # 1C Time

Components	Area	Attenuation	A x A Factor	Concentration (ppm)
M	72.10	16	1153.6	12.8
B				BDL
T				"
E				"
X				"

FIELD ANALYSIS DATA SHEETS

Plant Lehman Roberts Date 9-3-91

Location Mphs, TN

1. General Information:

Source temp. (°C)		Columnar temperature:	
Probe temp. (°C)		Initial (°C)/time (min)	
Ambient temp. (°C)		Program rate (°C/min)	
Atmospheric press. (in. Hg)		Final (°C)/time (min)	
Source press. (in. Hg)		Carrier gas flow rate (ml/min)	
Absolute source press. (mm)		Detector temperature (°C)	
Sampling rate (liter/min)		Injection time (24-hr basis)	
Sample loop volume (ml)		Chart speed (mm/min)	
Sample loop temp. (°C)		Dilution ratio	
Dilution gas flow rate (ml/min)		Dilution gas used (symbol)	

2. Field Analysis Data:

Run # 10 Time ______

Components	Area	Attenuation	A x A Factor	Concentration (ppm
Methane	181.36	16	2901.76	32.2
B				
T				
E				
X				

Run # ______ Time ______

Components	Area	Attenuation	A x A Factor	Concentration (ppm

Run # ______ Time ______

Components	Area	Attenuation	A x A Factor	Concentration (ppm

FIELD ANALYSIS DATA SHEETS

Plant Lehman Roberts Date 9-3-91

Location Mphs TN

1. General Information:

Source temp. (°C)	121	Columnar temperature:	
Probe temp. (°C)	121	Initial (°C)/time (min)	75
Ambient temp. (°C)	32	Program rate (°C/min)	–
Atmospheric press. (in. Hg)	30.01	Final (°C)/time (min)	75
Source press. (in. Hg)		Carrier gas flow rate (ml/min)	30
Absolute source press. (mm)		Detector temperature (°C)	
Sampling rate (liter/min)	1	Injection time (24-hr basis)	
Sample loop volume (ml)	1	Chart speed (mm/min)	
Sample loop temp. (°C)	75	Dilution ratio	
Dilution gas flow rate (ml/min)		Dilution gas used (symbol)	

2. Field Analysis Data:

Run # 2A Time 14:17 - 15:17

Components	Area	Attenuation	A x A Factor	Concentration (ppm
Methane				BDL
B				"
T				"
E				"
X				"

Run # 2B Time

Components	Area	Attenuation	A x A Factor	Concentration (ppm
M	9362			16.6
B	4.04			.43
T				
E				
X				

Run # 2C Time

Components	Area	Attenuation	A x A Factor	Concentration (ppm
M	24.71			4.3
B	7.34			.69
T				
E				
X				

FIELD ANALYSIS DATA SHEETS

Plant Pelman - Roberts Date 9-3-91

Location Mphs, TN

1. General Information:

Source temp. (°C)		Columnar temperature:	
Probe temp. (°C)		Initial (°C)/time (min)	
Ambient temp. (°C)		Program rate (°C/min)	
Atmospheric press. (in. Hg)		Final (°C)/time (min)	
Source press. (in. Hg)		Carrier gas flow rate (ml/min)	
Absolute source press. (mm)		Detector temperature (°C)	
Sampling rate (liter/min)		Injection time (24-hr basis)	
Sample loop volume (ml)		Chart speed (mm/min)	
Sample loop temp. (°C)		Dilution ratio	
Dilution gas flow rate (ml/min)		Dilution gas used (symbol)	

2. Field Analysis Data:

Run # 20 Time

Components	Area	Attenuation	A x A Factor	Concentration (ppm
M	136.08	16	2177.28	24.2
B				
T				
E				
X				

Run # Time

Components	Area	Attenuation	A x A Factor	Concentration (ppm

Run # Time

Components	Area	Attenuation	A x A Factor	Concentration (ppm

FIELD ANALYSIS DATA SHEETS

Plant Lehman Roberts Date 9-3-91

Location Mphs, TN

1. General Information:

Source temp. (°C)	121	Columnar temperature:	
Probe temp. (°C)	121	Initial (°C)/time (min)	75
Ambient temp. (°C)	32	Program rate (°C/min)	–
Atmospheric press. (in. Hg)	30.01	Final (°C)/time (min)	75
Source press. (in. Hg)		Carrier gas flow rate (ml/min)	30
Absolute source press. (mm)		Detector temperature (°C)	
Sampling rate (liter/min)	1	Injection time (24-hr basis)	
Sample loop volume (ml)	1	Chart speed (mm/min)	
Sample loop temp. (°C)	75	Dilution ratio	
Dilution gas flow rate (ml/min)		Dilution gas used (symbol)	

2. Field Analysis Data:

Run # 3A Time 16:30-17:30

Components	Area	Attenuation	A x A Factor	Concentration (ppm)
Methane	627.34	16	10037.44	111.7
B	13.46	16	215.36	1.2
T				
E				
X				

Run # 3B Time

Components	Area	Attenuation	A x A Factor	Concentration (ppm)
M	144.85	16	2317.6	25.8
B	11.06	16	176.96	.98
T				
E				
X				

Run # 3C Time

Components	Area	Attenuation	A x A Factor	Concentration (ppm)
M	26.98	16	431.68	4.8
B				
T				
E				
X				

FIELD ANALYSIS DATA SHEETS

Plant Lebanon Roberts Date 9-3-91

Location Mphs, TN

1. General Information:

Source temp. (°C)		Columnar temperature:	
Probe temp. (°C)		Initial (°C)/time (min)	
Ambient temp. (°C)		Program rate (°C/min)	
Atmospheric press. (in. Hg)		Final (°C)/time (min)	
Source press. (in. Hg)		Carrier gas flow rate (ml/min)	
Absolute source press. (mm)		Detector temperature (°C)	
Sampling rate (liter/min)		Injection time (24-hr basis)	
Sample loop volume (ml)		Chart speed (mm/min)	
Sample loop temp. (°C)		Dilution ratio	
Dilution gas flow rate (ml/min)		Dilution gas used (symbol)	

2. Field Analysis Data:

Run # 3D Time ______

Components	Area	Attenuation	A x A Factor	Concentration (
M	51.09	16	817.44	9.1
B	6.01	16	96.16	.58
T				
E				
X				

Run # ______ Time ______

Components	Area	Attenuation	A x A Factor	Concentration (

Run # ______ Time ______

Components	Area	Attenuation	A x A Factor	Concentration (

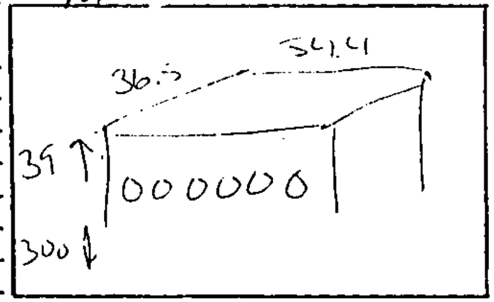
VIII. FIELD DATA

C. PAH'S

RAMCON ENVIRONMF""AL CORPORATION

Plant Lehman - Roberts
Location Memphis Tn.
Operator C. Creek
Date 9-3-91
Run No. 1 PAH
Sample Box No. 1
Meter Box No. C-124
Meter H @ 2.04
C Factor ~~1.04~~ .97
Pitot Tube Coefficient Cp .84

1.2



Schematic of Stack Cross Section

Ambient Temperature 80
Barometric Pressure 30.01
Assumed Moisture, % 35
Probe Length, m(ft) 4ft
Nozzle Identification No. .0003409
Avg. Calibrated Nozzle Dia., (in.) .250/.250/.250
Probe Heater Setting 4
Leak Rate, m^3/min.(cfm) .015 At 12
Probe Liner Material ss
Static Pressure, mm Hg (in.Hg) +.01
Filter No. TH5511

	IMPG. VOLUME ml	SILICA GEL WEIGHT, g
FINAL	794	238
INITIAL	200	200
DIFFERENCE	594	38

TRAV. PT NO.	SAMPLING TIME (θ) min.	VACUUM in. Hg	STACK TEMP (T_s) °F	VELOCITY HEAD (P_s) in H20	PRESSURE DIFF. ORF. MTR in H20	GAS SAMPLE VOLUME ft^3	GAS SAMPLE TEMP. AT DRY GAS METER °F Inlet	Outlet	FILTER HOLDER TEMP °F	GAS TEMP LVG CONDENSER OR LAST IMPINGER °F
A 1	11:26 / 11:28	4	255	.61	1.0	81.4 / 82.6	80	80	250	60
2	11:30	5	255	.64	1.1	83.7	110	92	250	60
3	11:32	5	255	.65	1.1	84.9	110	92	250	60
4	11:34	7	255	.75	1.3	86.1	114	92	250	60
5	11:36	7	255	.77	1.3	87.2	116	92	250	60
B 1	11:40 / 11:42	7	255	.65	1.1	88.2	110	94	250	60
2	11:44	7	255	.71	1.2	89.6	110	94	250	60
3	11:46	7	255	.78	1.3	90.5	108	94	250	60
4	11:48	7	255	.75	1.3	91.3	108	94	250	60
5	11:50	7	255	.60	1.0	92.3	108	94	250	60

Form #RE[illegible]6

RAMCOn emissions test log sheet, cont. DATE 9-3-91 LOCATION Memphis TN TEST NO. 1

TRAVERSE POINT	SAMPLING TIME θ (min)	VACUUM mm Hg (in. Hg)	STACK TEMP T_s (°F)	VELOCITY HEAD ΔP_s (in. H_2O)	ORFICE DIFF. PRESSURE ΔH (in. H_2O)	GAS VOLUME V_m (ft.^{3})	GAS SAMPLE TEMP. (°F) in	GAS SAMPLE TEMP. (°F) out	SAMPLE BOX TEMP. (°F)	IMPINGER TEMP (°F)
C 1	11:53 / 11:54	10	255	.73	1.2	93.2	104	94	250	60
2	11:57	10	255	.70	1.2	94.2	104	94	250	60
3	11:59	10	255	.85	1.4	95.2	104	94	250	60
4	12:01	10	255	.84	1.4	96.4	104	94	250	60
5	12:03	10	255	.79	1.3	97.8	104	94	250	60
D 1	12:05 / 12:07	10	255	.95	1.6	99.3	106	96	250	60
2	12:09	10	255	.95	1.6	101.0	106	96	250	60
3	12:11	10	255	.85	1.4	102.6	108	96	250	60
4	12:13	10	255	.83	1.4	103.9	108	96	250	60
5	12:15	10	255	.78	1.3	105.4	108	96	250	60
E 1	12:17 / 12:19	10	235	.82	1.4	106.5	110	96	250	60
2	12:21	10	255	.90	1.5	108.1	110	96	250	60
3	12:23	10	255	.85	1.4	109.5	112	96	250	60
4	12:25	10	255	.82	1.4	110.8	112	96	250	60
5	12:27	10	255	.75	1.3	112.1	112	96	250	60
F 1	12:28 / 12:30	10	255	.70	1.2	113.3	112	96	250	60
2	12:32	12	255	.98	1.7	114.4	114	96	250	60
3	12:34	12	255	1.0	1.7	116.2	114	96	250	60
4	12:36	12	255	.99	1.6	117.7	114	96	250	60
5	12:38	12	255	.95	1.6	119.176	114	96	250	60

RAMCON ENVIRONMENTAL CORPORATION

Plant Lehman Roberts

m = ~~2.26~~ 1.46

Location Memphis Tn
Operator C. Cook
Date 9-3-91
Run No. 2 PAH's
Sample Box No. 1
Meter Box No. C-124
Meter H @ 2.04
C Factor .97
Pitot Tube Coefficient Cp .84

Ambient Temperature 90
Barometric Pressure 30.01
Assumed Moisture, % 4.5
Probe Length, m(ft) 4
Nozzle Identification No. .0003409
Avg. Calibrated Nozzle Dia., (in.) .250/.250/.250
Probe Heater Setting 4
Leak Rate, m^3/min. (cfm) 0 At 12"
Probe Liner Material 4
Static Pressure, mm Hg (in.Hg) +.01
Filter No. TH5510

	IMP. VOLUME ml	SILICA GEL WEIGHT, g
FINAL	716	229
INITIAL	200	200
DIFFERENCE	516	29

Schematic of Stack Cross Section

TRAV. PT NO.	SAMPLING TIME (θ) min.	VACUUM in. Hg	STACK TEMP (T_s) °F	VELOCITY HEAD (P_s) in H2O	PRESSURE DIFF. ORF. MTR in H2O	GAS SAMPLE VOLUME ft^3	GAS SAMPLE TEMP. AT DRY GAS METER °F Inlet	GAS SAMPLE TEMP. AT DRY GAS METER °F Outlet	FILTER HOLDER TEMP °F	GAS TEMP LVG CONDENSER OR LAST IMPINGER °F
A 1	2:23 / 2:25	6	255	.65	.95	119.600 / 120.7	108	108	250	60
2	2:27	6	255	.70	1.0	121.8	116	108	250	60
3	2:29	7	255	.74	1.1	123.0	120	108	250	60
4	2:31	7	255	.76	1.1	124.1	122	108	250	60
5	2:33	7	255	.76	1.1	125.2	122	108	250	60
B 1	2:34 / 2:36	7	255	.70	1.0	126.4	122	108	250	60
2	2:38	7	255	.81	1.2	127.5	124	108	250	60
3	2:40	9	255	.91	1.3	128.8	124	108	250	60
4	2:42	10	255	.94	1.4	130.1	126	108	250	60
5	2:44	10	255	.79	1.2	131.4	126	108	250	60

Form #REC-05

Form [redacted] RE[redacted]

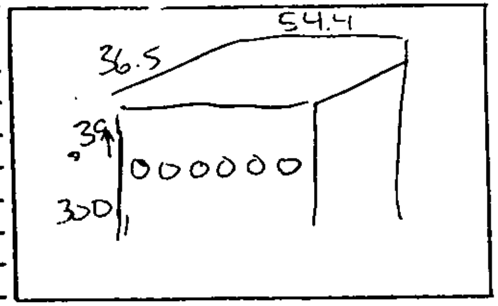
RAMCON emissions test log sheet, cont. DATE 9-3-91 LOCATION Memphis Tn. TEST NO. 2

TRAVERSE POINT	SAMPLING TIME θ (min)	VACUUM mm Hg (in. Hg)	STACK TEMP T_s (°F)	VELOCITY HEAD ΔP_s (in. H_2O)	ORFICE DIFF. PRESSURE ΔH (in. H_2O)	GAS VOLUME V_m (ft^3)	GAS SAMPLE TEMP. (°F) in	GAS SAMPLE TEMP. (°F) out	SAMPLE BOX TEMP. (°F)	IMPINGER TEMP (°F)
C1	2:46 / 2:48	7	255	.70	1.0	132.6	122	110	250	60
2	2:50	8	255	.87	1.3	133.7	126	108	250	60
3	2:52	10	255	.95	1.4	135.0	128	108	250	60
4	2:54	10	255	.94	1.4	136.4	128	108	250	60
5	2:56	10	255	.77	1.1	137.6	128	108	250	60
D1	2:57 / 2:59	9	255	.95 ~~.88~~ cc	1.4	138.9	126	108	250	60
2	3:01	9	255	.95	1.4	140.3	128	108	250	60
3	3:03	11	255	1.0	1.5	141.7	128	108	250	60
4	3:05	11	255	1.1	1.6	143.0	128	108	250	60
5	3:07	11	255	.98	1.4	144.4	130	108	250	60
E1	3:08 / 3:10	10	255	.95	1.4	145.6	134	108	250	60
2	3:12	11	255	1.1	1.6	147.0	128	108	250	60
3	3:14	12	255	1.1	1.6	148.8	130	108	250	60
4	3:16	12	255	1.1	1.6	149.8	130	108	250	60
5	3:18	11 ~~12~~ cc	255	.96	1.4	151.1	128	108	250	60
F1	3:20 / 3:22	9	255	.79	1.2	152.8	124	108	250	60
2	3:24	10	255	.79	1.2	154.1	128	108	250	60
3	3:26	11	255	1.1	1.6	154.9	128	108	250	60
4	3:28	12	255	1.1	1.6	156.3	128	108	250	60
5	3:30	12	255	1.1	1.6	157.713	128	108	250	60

RAMCON ENVIRONMEN L CORPORATION

Plant Lehman Roberts

Location Memphis Tn
Operator C. Crook
Date 9-3-91
Run No. 3 FAll
Sample Box No. 1
Meter Box No. C-124
Meter H @ 2.04
C Factor .97
Pitot Tube Coefficient Cp .84



Schematic of Stack Cross Section

Ambient Temperature 90
Barometric Pressure 30.01
Assumed Moisture, % 4.5
Probe Length, m(ft) 4'
Nozzle Identification No. .0003409
Avg. Calibrated Nozzle Dia., (in.) .250/.259/.250
Probe Heater Setting 4
Leak Rate, m^3/min. (cfm) 0 At 10"
Probe Liner Material SS
Static Pressure, mm Hg (in. Hg) +.01
Filter No.

	IMPINGER VOLUME ml	SILICA GEL WEIGHT g
FINAL	722	235
INITIAL	200	200
DIFFERENCE	522	35

TRAV. PT NO.	SAMPLING TIME (θ) min.	VACUUM in. Hg	STACK TEMP (T_s) °F	VELOCITY HEAD (P_s) in H20	PRESSURE DIFF. ORF. MTR in H20	GAS SAMPLE VOLUME ft^3	GAS SAMPLE TEMP. AT DRY GAS METER °F Inlet	GAS SAMPLE TEMP. AT DRY GAS METER °F Outlet	FILTER HOLDER TEMP °F	GAS TEMP LVG CONDENSER OR LAST IMPINGER °F
A 1	4:38 / 4:40	7	255	1.1	1.6	157.851 / 159.3	110	110	250	60
2	4:42	7	255	1.1	1.6	160.8	122	108	250	60
3	4:44	7	255	.70	1.0	162.0	122	108	250	60
4	4:46	6	255	.72	1.1	163.2	124	108	250	60
5	4:48	7	255	.72	1.1	164.3	126	108	250	60
B 1	4:50 / 4:52	5	255	.75	1.1	165.4	122	108	250	60
2	4:54	5	255	.81	1.2	166.8	124	108	250	60
3	4:56	8	255	.94	1.21	168.0	128	108	250	60
4	4:58	9	255	.96	1.4	169.3	128	108	250	60
5	5:00	9	255	.44	1.4	170.7	128	108	250	60

[redacted]Fo[redacted]RE[redacted]6

RAMCOn emissions test log sheet, cont. DATE 9-3-91 LOCATION Mph. Tn TEST NO. 3

TRAVERSE POINT	SAMPLING TIME θ (min)	VACUUM mm Hg (in. Hg)	STACK TEMP T_s (°F)	VELOCITY HEAD ΔP_s (in. H_2O)	ORFICE DIFF. PRESSURE ΔH (in. H_2O)	GAS VOLUME V_m (ft.^{3})	GAS SAMPLE TEMP. (°F) in	GAS SAMPLE TEMP. (°F) out	SAMPLE BOX TEMP. (°F)	IMPINGER TEMP (°F)
C 1	5:01 / 5:03	8	255	.92	1.3	171.8	126	108	250	60
2	5:05	9	255	1.0	1.4	173.2	128	108	250	60
3	5:07	9	255	1.0	1.4	174.6	128	108	250	60
4	5:09	9	255	1.1	1.6	176.0	130	108	250	60
5	5:11	8	255	.80	1.2	177.3	132	108	250	60
D 1	5:12 / 5:14	11	255	1.1	1.6	178.7	128	108	250	60
2	5:16	11	255	1.1	1.6	180.2	130	108	250	60
3	5:18	9	255	.87	1.3	181.4	130	108	250	60
4	5:20	9	255	.85	1.2	182.8	132	108	250	60
5	5:22	9	255	.64	.93	183.8	132	108	250	60
E 1	5:23 / 5:25	10	255	1.0	1.4	185.2	128	108	250	60
2	5:27	10	255	1.1	1.6	186.5	130	108	250	60
3	5:29	11	255	1.1	1.6	187.9	132	108	250	60
4	5:31	11	255	1.1	1.6	189.5	132	108	250	60
5	5:33	10	255	.91	1.3	190.7	132	108	250	60
F 1	5:34 / 5:36	8	255	1.1	1.6	192.2	128	108	250	60
2	5:38	11	255	1.1	1.6	193.6	130	108	250	60
3	5:40	11	255	1.1	1.6	194.7	132	108	250	60
4	5:42	11	255	1.1	1.6	196.2	132	108	250	60
5	5:44	11	255	1.0	1.4	197.5 16.0	132	108	250	60

rAH's

Lehman - Robert
Company Name

9-3-91
Date

REFERENCE METHOD 3: GAS ANALYSIS BY FYRITE

FUEL	F_o FACTORS
WOOD	1.0540
BARK	1.0830
ANTHRACITE	1.0699
BITUMINOUS	1.1398
LIGNITE	1.0761
OIL	1.3465
GAS	1.7489
PROPANE	1.5095
BUTANE	1.4791

$$O_2\% = 20.9 - [F_o \times CO_2\%]$$

RUN #1: ____ = 20.9 - [____ x ____]

RUN #2: ____ = 20.9 - [____ x ____]

RUN #3 ____ = 20.9 - [____ x ____]

RUN 1:	CO_{2X}	10	CO_{2X}	8	CO_{2X}	8	AVG.	8.7
	O_{2X}	5	O_{2X}	5	O_{2X}	4	AVG.	4.7
	N_{2X}		N_{2X}		N_{2X}		AVG.	86.6
RUN 2:	CO_{2X}	8	CO_{2X}	7	CO_{2X}	7	AVG.	7.3
	O_{2X}	6	O_{2X}	5	O_{2X}	6	AVG.	5.7
	N_{2X}		N_{2X}		N_{2X}		AVG.	87.0
RUN 3:	CO_{2X}	8	CO_{2X}	8	CO_{2X}	7	AVG.	7.7
	O_{2X}	5	O_{2X}	5	O_{2X}	5	AVG.	5.0
	N_{2X}		N_{2X}		N_{2X}		AVG.	87.3

VIII. FIELD DATA

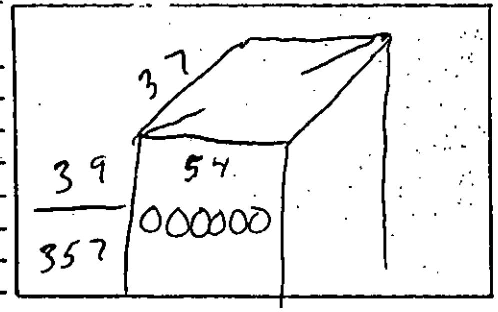
D. FORMALDEHYDE

RAMCON ENVIRONMENTAL CORPORATION

Plant LEIGHMAN ROBERTS

FORMALDAHYDE

Location MEMPHIS, TN
Operator W. T. LOCKETT
Date 9-30-91
Run No. 1
Sample Box No. 1
Meter Box No. C-185
Meter H @ 1.417
C Factor 1.011
Pitot Tube Coefficient Cp .84



Schematic of Stack Cross Section

Ambient Temperature 72
Barometric Pressure 30.15
Assumed Moisture, % 30
Probe Length, m(ft) 4'
Nozzle Identification No. .000 3976
Avg. Calibrated Nozzle Dia., (in.) .270/.270/.270
Probe Heater Setting 7
Leak Rate, m^3/min.(cfm) .005 @ 10"
Probe Liner Material GLASS
Static Pressure, mm Hg(in.Hg)
Filter No. N.A.

	IM VOL ml	SILICA GEL WEIGHT g
FINAL	616	549.7
INITIAL	200	531.1
DIFFERENCE	416	18.6

TRAV. PT NO.	SAMPLING TIME (θ)min.	VACUUM in. Hg	STACK TEMP (T_s) °F	VELOCITY HEAD (P_s) in H20	PRESSURE DIFF. ORF. MTR in H20	GAS SAMPLE VOLUME ft^3	GAS SAMPLE TEMP. AT DRY GAS METER °F Inlet	Outlet	FILTER HOLDER TEMP °F	GAS TEMP LVG CONDENSER OR LAST IMPINGER °F
A 1	10:56 / 10:59	2	235	.55	1.1	889.0 / 890.9	72	72	260	55
2	11:02	2	235	.67	1.3	893.1	90	74	260	55
3	11:05	2	235	.63	1.2	895.1	96	74	260	55
4	11:08	2	230	.50	.99	897.2	100	74	260	55
B 1	11:09:30 / 11:12:30	2	235	.75	1.5	899.3	96	76	260	55
2	11:15:30	2	240	.72	1.4	901.6	104	76	260	55
3	11:18:30	2	235	.65	1.3	903.7	106	78	260	55
4	11:21:30	2	235	.51	1.0	905.5	108	78	260	55
C 1	11:23 / 11:26	2	235	.57	1.1	907.5	102	78	260	55
2	11:29	2	235	.77	1.5	909.8	108	80	260	55
3	11:32	2	235	.63	1.2	911.9	110	80	260	55
4	11:35	2	235	.50	.98	913.8	112	80	260	55

Form #REC-06

RAMCON emissions test log sheet, cont. DATE 9-30-91 LOCATION Lehman Rbt TEST NO. 1

TRAVERSE POINT	SAMPLING TIME θ (min)	VACUUM mm Hg (in. Hg)	STACK TEMP T_s (°F)	VELOCITY HEAD ΔP_s (in. H_2O)	ORFICE DIFF. PRESSURE ΔH (in. H_2O)	GAS VOLUME V_m (ft^3)	GAS SAMPLE TEMP. (°F) in	GAS SAMPLE TEMP. (°F) out	SAMPLE BOX TEMP. (°F)	IMPINGER TEMP (°F)
D 1	11:36 / 11:39	2	235	.92	1.8	916.3	108	80	260	55
2	11:42	2	240	.80	1.6	918.7	112	80	260	55
3	11:45	2	240	.58	1.1	920.7	114	82	260	55
4	11:48	2	240	.50	.99	922.6	114	82	260	55
E 1	11:50 / 11:53	2	240	.84	1.7	925.2	110	82	260	55
2	11:56	2	245	.77	1.5	927.5	114	82	260	55
3	11:59	2	245	.66	1.3	929.6	116	84	260	55
4	12:02	2	245	.63	1.2	931.7	116	84	260	55
F 1	12:03 / 12:06	2	235	.79	1.6	934.2	112	84	260	55
2	12:09	2	235	.74	1.5	936.5	116	84	260	59
12:18 / 12:21 3	~~12:12~~	2	230	.69	1.4	938.8	100	86	260	55
12:24 4	~~12:15~~	2	230	.63	1.2	940.918	112	86	260	55

RAMCON ENVIRONMENTAL CORPORATION

Plant Leiman Roberts

Formaldahyde

Location Memphis, TN
Operator W.J. Lockett
Date 9-30-91
Run No. 2
Sample Box No. 1
Meter Box No. C-185
Meter H @ 1.417
C Factor 1.011
Pitot Tube Coefficient Cp .84

Ambient Temperature 86
Barometric Pressure 30.15
Assumed Moisture, % 30
Probe Length, m(ft) 4
Nozzle Identification No.
Avg. Calibrated Nozzle Dia., (in.)
Probe Heater Setting 7
Leak Rate, m^3/min.(cfm) .000 @ 5"
Probe Liner Material Glass
Static Pressure, mm Hg(in.Hg)
Filter No. N.A.

	IMP VOL ml	SILICA GEL WEIGHT g
FINAL	630	549.8
INITIAL	200	529.3
DIFFERENCE	430	20.5

Schematic of Stack Cross Section

TRAV. PT NO.	SAMPLING TIME (θ)min.	VACUUM in. Hg	STACK TEMP (Ts) °F	VELOCITY HEAD (Ps) in H20	PRESSURE DIFF. ORF. MTR in H20	GAS SAMPLE VOLUME ft^3	GAS SAMPLE TEMP. AT DRY GAS METER °F Inlet	Outlet	FILTER HOLDER TEMP °F	GAS TEMP LVG CONDENSER OR LAST IMPINGER °F
A 1	13:42 / 13:45	2	250	.61	1.2	941.5 / 943.6	84	84	260	55
2	13:48	2	255	.56	1.1	945.6	104	86	260	55
3	13:51	2	255	.60	1.2	947.7	110	86	260	55
4	13:54	2	250	.62	1.2	949.8	112	86	260	55
B 1	13:55 / 13:58	2	245	.61	1.2	951.9	110	86	260	55
2	14:01	2	250	.69	1.4	954.1	116	86	260	55
3	14:04	2	250	.67	1.3	956.3	116	86	260	55
4	14:07	2	250	.63	1.2	958.5	116	56	260	55
C 1	14:08 / 14:11	2	245	.75	1.5	960.8	104	86	260	55
2	14:14	2	255	.72	1.4	963.1	118	86	260	55
3	14:17	2	250	.67	1.3	965.2	118	88	260	55
4	14:20	2	250	.62	1.2	967.3	120	88	260	55

Form #REC-05

Form #REC-06

RAMCON emissions test log sheet, cont. DATE 9-30-91 LOCATION Lehman Roberts TEST NO. 2

TRAVERSE POINT	SAMPLING TIME θ (min)	VACUUM mm Hg (in. Hg)	STACK TEMP T_s (°F)	VELOCITY HEAD ΔP_s (in. H_2O)	ORFICE DIFF. PRESSURE ΔH (in. H_2O)	GAS VOLUME V_m (ft^3)	GAS SAMPLE TEMP. (°F) in	GAS SAMPLE TEMP. (°F) out	SAMPLE BOX TEMP. (°F)	IMPINGER TEMP (°F)
D 1	14:21 / 14:24	2	240	.68	1.3	969.5	114	88	260	55
2	14:27	2	240	.72	1.4	971.7	120	88	260	55
3	14:30	2	240	.69	1.4	974.0	120	88	260	55
4	14:33	2	240	.65	1.3	976.2	120	88	260	55
E 1	14:34 / 14:37	2	240	.62	1.2	978.3	116	90	260	55
2	14:40	2	240	.76	1.5	980.6	120	90	260	55
3	14:43	2	245	.70	1.4	983.0	122	90	260	55
4	14:46	2	245	.65	1.3	985.2	122	90	260	55
F 1	14:49 / 14:50	2	245	.55	1.1	987.1	116	90	260	55
2	14:53	2	245	.63	1.2	987.2	120	90	260	55
3	14:56	2	245	.64	1.3	991.5	120	90	260	55
4	14:59	2	250	.55	1.1	993.536	120	90	260	55

RAMCON ENVIRONMENTAL CORPORATION

Plant Lyuman Roberts

Formaldahyde

Location Memphis, TN
Operator W. T. Lockett
Date 9-30-91
Run No. 3
Sample Box No. 1
Meter Box No. C-185
Meter H @ 1.417
C Factor 1.011
Pitot Tube Coefficient Cp .84

Ambient Temperature 88
Barometric Pressure 30.15
Assumed Moisture, % 30
Probe Length, m(ft) 4'
Nozzle Identification No. .270
Avg. Calibrated Nozzle Dia., (in.) .270/.270/.270
Probe Heater Setting 7
Leak Rate, m^3/min. (cfm)
Probe Liner Material Glass
Static Pressure, mm Hg (in.Hg)
Filter No. NA

	IMP VOL. ml	SILICA GEL WEIGHT, g
FINAL		496.0
INITIAL	200	488.1
DIFFERENCE	4A0	17.9

Schematic of Stack Cross Section

TRAV. PT NO.		SAMPLING TIME (θ) min.	VACUUM in. Hg	STACK TEMP (T_s) °F	VELOCITY HEAD (P_s) in H2O	PRESSURE DIFF. ORF. MTR in H2O	GAS SAMPLE VOLUME ft³	GAS SAMPLE TEMP. AT DRY GAS METER °F Inlet	GAS SAMPLE TEMP. AT DRY GAS METER °F Outlet	FILTER HOLDER TEMP °F	GAS TEMP LVG CONDENSER OR LAST IMPINGER °F
A	1	16:13 / 16:16	2	240	.61	1.2	000.2 / 2.3	92	92	260	60
	2	16:19	2	240	.70	1.4	4.6	108	92	260	60
	3	16:22	2	240	.59	1.2	6.7	114	92	260	60
	4	16:25	2	240	.47	.93	8.6	116	92	260	60
B	1	16:26 / 16:29	2	240	.75	1.5	10.9	112	92	260	60
	2	16:32	2	240	.79	1.6	13.3	118	92	260	60
	3	16:35	2	240	.64	1.3	15.6	120	92	260	60
	4	16:38	2	240	.50	.99	17.5	120	92	260	60
C	1	16:39 / 16:42	2	240	.78	1.5	19.8	116	92	260	60
	2	16:45	2	245	.75	1.5	22.2	120	92	260	60
	3	16:48	2	245	.60	1.2	24.3	120	92	260	60
	4	16:51	2	245	.49	.97	26.2	120	92	260	60

Form #REC-06

RAMCON emissions test log sheet, cont. DATE 9-30-9. LOCATION [illegible] TEST NO. 3

TRAVERSE POINT	SAMPLING TIME θ (min)	VACUUM mm Hg (in. Hg)	STACK TEMP T_s (°F)	VELOCITY HEAD ΔP_s (in. H_2O)	ORFICE DIFF. PRESSURE ΔH (in. H_2O)	GAS VOLUME Vm (ft^3)	GAS SAMPLE TEMP. (°F) in	GAS SAMPLE TEMP. (°F) out	SAMPLE BOX TEMP. (°F)	IMPINGER TEMP (°F)
D 1	16:52 / 16:55	2	240	.74	1.5	28.6	116	92	260	60
2	16:58	2	240	.70	1.4	30.9	120	92	260	60
3	17:01	2	240	.62	1.2	33.0	120	92	260	60
4	17:04	2	240	.46	.91	34.8	120	92	260	60
E 1	17:05 / 17:08	2	240	.82	1.6	37.2	116	92	260	60
2	17:11	2	245	.75	1.5	39.6	120	92	260	60
3	17:14	2	240	.65	1.3	41.8	120	92	260	60
4	17:17	2	240	.54	1.1	44.1	120	92	260	60
F 1	17:18 / 17:21	2	240	.69	1.4	46.1	120	92	260	60
2	17:24	2	240	.75	1.5	48.4	120	92	260	60
3	17:27	2	240	.70	1.4	50.8	120	92	260	60
4	17:30	2	240	.60	1.2	52.928	120	92	260	60

L'Ehman Roberts
Company Name

9/30/91
Date

REFERENCE METHOD 3: GAS ANALYSIS BY FYRITE

FUEL	F_o FACTORS
WOOD	1.0540
BARK	1.0830
ANTHRACITE	1.0699
BITUMINOUS	1.1398
LIGNITE	1.0761
OIL	1.3465
GAS	1.7489
PROPANE	1.5095
BUTANE	1.4791

$$O_2\% = 20.9 - [F_o \times CO_2\%]$$

RUN #1: ____ = 20.9 - [____ x ____]

RUN #2: ____ = 20.9 - [____ x ____]

RUN #3 ____ = 20.9 - [____ x ____]

RUN 1:	$CO_{2\%}$	3.5	$CO_{2\%}$	1	$CO_{2\%}$	1.5	AVG.	2.0
	$O_{2\%}$	14.8	$O_{2\%}$	19.2	$O_{2\%}$	18.3	AVG.	17.4
	$N_{2\%}$		$N_{2\%}$		$N_{2\%}$		AVG.	80.6
RUN 2:	$CO_{2\%}$	6	$CO_{2\%}$	4	$CO_{2\%}$	3	AVG.	4.3
	$O_{2\%}$	10.4	$O_{2\%}$	13.9	$O_{2\%}$	15.6	AVG.	13.3
	$N_{2\%}$		$N_{2\%}$		$N_{2\%}$		AVG.	82.4
RUN 3:	$CO_{2\%}$	3	$CO_{2\%}$	2	$CO_{2\%}$	1.5	AVG.	2.2
	$O_{2\%}$	15.6	$O_{2\%}$	17.4	$O_{2\%}$	18.3	AVG.	17.1
	$N_{2\%}$		$N_{2\%}$		$N_{2\%}$		AVG.	80.7

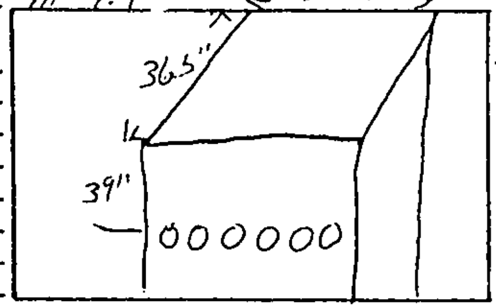
VIII. FIELD DATA

E. PARTICULATE & CONDENSIBLE PM

RAMCON ENVIRONMENTAL CORPORATION

Plant Lehman-Roberts

Location Memphis Tn.
Operator C. Crook
Date 9-4-91
Run No. 1 Condensable
Sample Box No. 1
Meter Box No. C-129
Meter H @ 2.04
C Factor .97
Pitot Tube Coefficient Cp .84



Schematic of Stack Cross Section

Ambient Temperature 75
Barometric Pressure 30.06
Assumed Moisture, % 46
Probe Length, m(ft) 4
Nozzle Identification No. 0203407
Avg. Calibrated Nozzle Dia., (in.) .25 x .25 x .25
Probe Heater Setting 4
Leak Rate, m³/min. (cfm) 0 At 5"
Probe Liner Material Glass
Static Pressure, mm Hg (in. Hg) +.01
Filter No. PT5469

	IMP. VOLUME ml	SILICA GEL WEIGHT g
FINAL	792	222
INITIAL	300	200
DIFFERENCE	492	22

TRAV. PT NO.	SAMPLING TIME (θ) min.	VACUUM in. Hg	STACK TEMP (T_s) °F	VELOCITY HEAD (P_s) in H2O	PRESSURE DIFF. ORF. MTR in H2O	GAS SAMPLE VOLUME ft³	GAS SAMPLE TEMP. AT DRY GAS METER °F Inlet	Outlet	FILTER HOLDER TEMP °F	GAS TEMP LVG CONDENSER OR LAST IMPINGER °F
A 1	9:52 / 9:54	1	260	.88	.98 / 1.2	198.7 / 200.0	86	86	250	60
2	9:56	1	260	.86	1.2	201.2	100	86	250	60
3	9:58	1	260	.77	1.1	202.5	102	86	250	60
4	10:00	1	260	.60	.84	203.3	104	86	250	60
5	10:02	1	260	.63	.88	204.3	106	86	250	60
B 1	10:03 / 10:05	1	260	.84	1.2	205.5	104	88	250	60
2	10:07	1	260	.90	1.3	206.7	108	88	250	60
3	10:09	1	260	.88	1.2	207.9	110	88	250	60
4	10:11	1	260	.89	1.2	209.1	114	90	250	60
5	10:13	1	260	.80	1.1	210.2	114	90	250	60

Form #REC 85

Fo[redacted]#RE[redacted]6

RAMCON emissions test log sheet, cont. DATE 9-4-,/ LOCATION Memphis Tq TEST NO. 1

TRAVERSE POINT	SAMPLING TIME θ (min)	VACUUM mm Hg (in. Hg)	STACK TEMP T_s (°F)	VELOCITY HEAD ΔP_s (in. H_2O)	ORFICE DIFF. PRESSURE ΔH (in. H_2O)	GAS VOLUME V_m (ft^3)	GAS SAMPLE TEMP. (°F) in	GAS SAMPLE TEMP. (°F) out	SAMPLE BOX TEMP. (°F)	IMPINGER TEMP (°F)
C 1	10:14 / 10:16	1	260	.91	1.3	211.5	112	92	250	60
2	10:18	1	260	.90	1.3	212.7	114	92	250	60
3	10:20	1	260	.94	1.3	214.0	116	92	250	60
4	10:22	2	260	.98	1.4	215.3	118	92	250	60
5	10:24	2	260	1.0	1.4	216.6	120	92	250	60
D 1	10:25 / 10:27	2	260	1.1	1.6	217.9	116	94	250	60
2	10:29	2	260	1.1	1.6	219.4	118	94	250	60
3	10:31	2	260	.73	1.0	220.5	120	94	250	60
4	10:33	2	260	.78	1.1	221.7	120	94	250	60
5	10:35	2	260	.78	1.1	222.9	120	94	250	60
E 1	10:36 / 10:38	2	260	.89	1.2	224.3	118	96	250	60
2	10:40	2	260	.91	1.3	225.4	120	96	250	60
3	10:42	2	260	.98	1.4	226.6	122	96	250	60
4	10:44	2	260	1.0	1.4	228.0	122	96	250	60
5	10:46	2	260	1.0	1.4	229.2	122	96	250	60
F 1	10:47 / 10:49	2	260	.96	1.3	230.4	118	98	250	60
2	10:51	2	260	1.0	1.4	231.7	122	98	250	60
3	10:53	2	260	1.2	1.7	233.2	122	98	250	60
4	10:55	2	260	1.1	1.6	234.5	124	98	250	60
5	10:57	2	260	1.1	1.6	235.935	124	98	250	60

RAMCON ENVIRONMENTAL CORPORATION

Plant Lehman Roberts
Location Memphis TN
Operator C. Crook
Date 9-4-91
Run No. 2 Condensables
Sample Box No. 1
Meter Box No. 1
Meter H @ 2.04
C Factor .97
Pitot Tube Coefficient Cp .84

Ambient Temperature 80
Barometric Pressure 30.06
Assumed Moisture, % 40
Probe Length, m(ft) 4
Nozzle Identification No. .0003407
Avg. Calibrated Nozzle Dia., (in.) .251.251.25
Probe Heater Setting 4
Leak Rate, m^3/min. (cfm) 0 A17"
Probe Liner Material Glass
Static Pressure, mm Hg (in.Hg) +.01
Filter No. PT5467

	IMP. VOLUME, ml	SILICA GEL WEIGHT, g
FINAL	895	230
INITIAL	300	200
DIFFERENCE	595	30

Schematic of Stack Cross Section

TRAV. PT NO.	SAMPLING TIME (θ) min.	VACUUM in. Hg	STACK TEMP (T_s) °F	VELOCITY HEAD (P_s) in H2O	PRESSURE DIFF. ORF. MTR in H2O	GAS SAMPLE VOLUME ft^3	GAS SAMPLE TEMP. AT DRY GAS METER °F Inlet	Outlet	FILTER HOLDER TEMP °F	GAS TEMP LVG CONDENSER OR LAST IMPINGER °F
A 1	11:43 / 11:45	2	280	.55	.99	236.4 / 237.4	100	100	250	60
2	11:47	4	280	.75	1.4	238.5	110	100	250	60
3	11:49	5	280	.96	1.7	240.0	114	98	250	60
4	11:51	5	280	.89	1.6	241.4	116	98	250	60
5	11:53	5	280	.98	1.8	243.0	120	98	250	60
B 1	11:54 / 11:56	5	280	.94	1.7	244.5	116	98	250	60
2	11:58	5	280	.91	1.6	245.8	120	98	250	60
3	12:00	5	280	1.0	1.8	247.3	122	98	250	60
4	12:02	5	280	1.0	1.8	248.9	122	98	250	60
5	12:04	5	280	.87	1.6	250.2	122	98	250	60

Form #REC-05

Fo[redacted]RE[redacted]6

RAMCO emissions test log sheet, cont. DATE 9-4-91 LOCATION Mphs. Tn. TEST NO. 2

TRAVERSE POINT	SAMPLING TIME θ (min)	VACUUM mm Hg (in. Hg)	STACK TEMP T_s (°F)	VELOCITY HEAD ΔP_s (in. H_2O)	ORFICE DIFF. PRESSURE ΔH (in. H_2O)	GAS VOLUME V_m (ft^3)	GAS SAMPLE TEMP. (°F) in	GAS SAMPLE TEMP. (°F) out	SAMPLE BOX TEMP. (°F)	IMPINGER TEMP (°F)
C 1	12:05 12:07	5	280	.91	1.6	251.7	118	98	250	60
2	12:09	5	280	.75	1.4	253.0	122	98	250	60
3	12:11	5	280	.86	1.5	254.6	122	98	250	60
4	12:13	5	280	1.0	1.8	255.8	124	98	250	60
5	12:15	5	280	1.0	1.8	257.3	124	98	250	60
D 1	12:16 12:18	4	280	.83	1.5	258.9	120	100	250	60
2	12:20	4	280	.83	1.5	260.2	122	98	250	60
3	12:22	4	280	.84	1.5	261.3	124	98	250	60
4	12:24	4	280	.72	1.3	262.7	124	98	250	60
5	12:26	4	280	.61	1.1	263.9	124	98	250	60
E 1	12:27 12:29	5	280	.92	1.7	265.3	120	98	250	60
2	12:31	5	280	.88	1.6	266.7	124	98	250	60
3	12:33	5	280	.77	1.4	268.1	124	100	250	60
4	12:35	5	280	22.109844 .71	1.3	269.4	126	100	250	60
5	12:37	5	280	.60	1.1 38.09	270.6	126	5468 100	250	60
F 1	12:38 12:40	7	280	1.1	2.0	272.3	120	100	250	60
2	12:42	6	280	1.0	1.8	273.9	124	100	250	60
3	12:44	6	280	1.0	1.8	275.4	126	100	250	60
4	12:46	4	280	1.0	1.8	276.7	126	100	250	60
5	12:48	6	280	1.0	1.8	278.234	126	100	250	60

RAMCON ENVIRONMF""AL CORPORATION

Plant Lehman-Roberts
Location Memphis Tn.
Operator C. Crook
Date 9-4-91
Run No. 3 Condensable
Sample Box No. 1
Meter Box No. C-124
Meter H @ 2.04
C Factor .97
Pitot Tube Coefficient Cp .84

Ambient Temperature 85
Barometric Pressure 30.06
Assumed Moisture, % 40
Probe Length, m(ft) 4
Nozzle Identification No. .0003407
Avg. Calibrated Nozzle Dia., (in.) .25/.25/.25
Probe Heater Setting 4
Leak Rate, m^3/min. (cfm) 0.016"
Probe Liner Material Glass
Static Pressure, mm Hg (in.Hg) +.01
Filter No. PT562

	IMPN. VOLUME, ml	SILICA GEL WEIGHT, g
FINAL	890	230
INITIAL	300	200
DIFFERENCE	590	30

Schematic of Stack Cross Section

TRAV. PT NO.	SAMPLING TIME (θ) min.	VACUUM in. Hg	STACK TEMP (T_s) °F	VELOCITY HEAD (P_s) in H20	PRESSURE DIFF. ORF. MTR in H_2O	GAS SAMPLE VOLUME ft^3	GAS SAMPLE TEMP. AT DRY GAS METER °F Inlet	Outlet	FILTER HOLDER TEMP °F	GAS TEMP LVG CONDENSER OR LAST IMPINGER °F
A 1	1:29 / 1:31	3	280	1.0	1.6	278.500 / 279.8	110	110	250	60
2	1:33	3	280	1.2	1.9	281.4	118	106	250	60
3	1:35	3	280	1.1	1.8	282.8	122	104	250	60
4	1:37	3	280	1.0	1.6	284.3	124	104	250	60
5	1:39	3	280	.98	1.6	285.7	124	104	250	60
B 1	1:40 / 1:42	3	280	1.1	1.8	287.2	122	104	250	60
2	1:44	3	280	1.1	1.8	288.7	124	104	250	60
3	1:46	3	280	1.1	1.8	290.2	124	104	250	60
4	1:48	3	280	1.0	1.6	291.8	126	104	250	60
5	1:50	3	280	.92	1.5	293.0	128	104	250	60
								2270		

Form #REC-05

Fo[redacted]RE[redacted]6

RAMCOn emissions test log sheet, cont. DATE 9-4-91 LOCATION Memphis Tn. TEST NO. 3

TRAVERSE POINT	SAMPLING TIME θ (min)	VACUUM mm Hg (in. Hg)	STACK TEMP T_s (°F)	VELOCITY HEAD ΔP_s (in. H_2O)	ORFICE DIFF. PRESSURE ΔH (in. H_2O)	GAS VOLUME V_m (ft.^{3})	GAS SAMPLE TEMP. (°F) in	GAS SAMPLE TEMP. (°F) out	SAMPLE BOX TEMP. (°F)	IMPINGER TEMP (°F)
C 1	1:51 / 1:53	3	280	.92	1.5	294.5	122	104	250	60
2	1:55	3	280	.92	1.5	295.9	126	104	250	60
3	1:57	3	280	1.0	1.6	297.4	128	104	250	60
4	1:59	3	280	1.0	1.6	299.2	128	104	250	60
5	2:01	3	280	1.0	1.6	300.0	128	104	250	60
D 1	2:02 / 2:04	3	280	.90	1.4	301.4	124	104	250	60
2	2:06	3	280	.85	1.4	302.9	128	104	250	60
3	2:08	3	280	.84	1.3	303.9	130	104	250	60
4	2:10	3	280	.74	1.2	305.2	130	104	250	60
5	2:12	3	280	.74	1.2	306.5	130	104	250	60
E 1	2:13 / 2:15	3	280	.95	1.5	307.9	126	104	250	60
2	2:17	3	280	.95	1.5	309.2	128	104	250	60
3	2:19	3	280	.88	1.4	310.5	130	104	250	60
4	2:21	3	280	.80	1.3	312.0	130	104	250	60
5	2:23	3	280	.79	1.3	313.2	130	104	250	60
F 1	2:24 / 2:26	3	280	.88	1.4	314.6	126	104	250	60
2	2:28	4	280	.94	1.5	315.9	128	104	250	60
3	2:30	3	280	.88	1.4	317.3	130	104	250	60
4	2:32	3	280	.85	1.4	318.5	130	104	250	60
5	2:34	3	280	.81	1.3	319.893	130	104	250	60

Condensables

Lehmon - Roberts
Company Name

9-4-91
Date

REFERENCE METHOD 3: GAS ANALYSIS BY FYRITE

FUEL	F_o FACTORS
WOOD	1.0540
BARK	1.0830
ANTHRACITE	1.0699
BITUMINOUS	1.1398
LIGNITE	1.0761
OIL	1.3465
GAS	1.7489
PROPANE	1.5095
BUTANE	1.4791

$$O_2\% = 20.9 - [F_o \times CO_2\%]$$

RUN #1: ____ = 20.9 - [____ x ____]

RUN #2: ____ = 20.9 - [____ x ____]

RUN #3 ____ = 20.9 - [____ x ____]

RUN 1:	CO_{2x}	9	CO_{2x}	9	CO_{2x}	9.5	AVG.	9.2
	O_{2x}	8	O_{2x}	9	O_{2x}	9	AVG.	8.7
	N_{2x}		N_{2x}		N_{2x}		AVG.	82.1
RUN 2:	CO_{2x}	7	CO_{2x}	8	CO_{2x}	8	AVG.	7.7
	O_{2x}	4	O_{2x}	5.5	O_{2x}	5.5	AVG.	5.0
	N_{2x}		N_{2x}		N_{2x}		AVG.	87.3
RUN 3:	CO_{2x}	4	CO_{2x}	4	CO_{2x}	4	AVG.	4.0
	O_{2x}	3	O_{2x}	3.5	O_{2x}	3	AVG.	3.2
	N_{2x}		N_{2x}		N_{2x}		AVG.	92.8

IX. CALIBRATIONS

A. PAH DATA

9-26-91

INITIAL CALIBRATION CHECK

DATE : 25-Se

TIME : 1

9-26-9

LAB FILE ID: RF20 =FE905 RF50 =FE901 RF80 =FE904
RF120=FE903 RF160=FE902

	COMPOUND	FLAG	RF 20NG	RF 50NG	RF 80NG	RF 120NG	RF 160NG	RF MEAN	%RSD
3	Naphthalene		1.036	0.941	0.976	0.989	0.965	0.981	3.6
4	2-Methylnaphthalene		0.812	0.794	0.802	0.812	0.858	0.816	3.0
6	2-Chloronaphthalene		0.940	0.924	0.915	0.901	0.856	0.907	3.5
7	Acenaphthylene		1.580	1.540	1.548	1.564	1.552	1.556	1.0
8	Acenaphthene	C	1.048	0.978	1.024	1.002	0.978	1.006	3.0
9	Fluorene		1.219	1.142	1.146	1.126	1.101	1.147	3.8
11	Phenanthrene		0.931	0.867	0.882	0.879	0.837	0.879	3.9
12	Anthracene		0.928	0.872	0.858	0.893	0.830	0.876	4.1
13	Fluoranthene	C	1.512	1.300	1.324	1.352	1.224	1.342	7.9
16	Pyrene		1.051	1.162	1.011	0.856	0.895	0.995	12.4
17	Benzo(a)anthracene		1.015	1.099	1.048	1.086	1.061	1.062	3.3
18	Chrysene		1.079	1.018	1.026	0.985	0.941	1.010	5.3
20	Benzo(b)fluoranthene		0.993	0.974	1.028	1.130	1.225	1.070	9.9
21	Benzo(k)fluoranthene		1.163	1.193	1.007	0.923	0.708	0.999	19.7
22	Benzo(e)pyrene		0.953	0.975	0.946	0.968	0.979	0.964	1.5
23	Benzo(a)pyrene	C	0.958	1.023	0.977	0.991	0.911	0.972	4.3
24	Perylene		0.659	0.580	0.567	0.568	0.557	0.586	7.1
25	Indeno(1,2,3-cd)pyrene		0.530	0.810	0.875	0.952	0.934	0.820	20.9
26	Dibenz(a,h)anthracene		0.642	0.843	0.942	0.985	0.973	0.877	16.3
27	Benzo(g,h,i)perylene		0.745	0.921	0.973	0.975	0.905	0.904	10.4
28	Pentachlorophenol	C	0.063	0.121	0.129	0.137	0.119	0.114	25.6
15	Terphenyl-d14	S	0.778	0.818	0.791	0.674	0.631	0.738	11.0
29	Nitrobenzene-d5	S	0.528	0.492	0.539	0.536	0.439	0.507	8.3
30	2-Fluorobiphenyl	S	0.927	0.864	0.860	0.824	0.772	0.850	6.7
31	2,4,6-Tribromophenol	S	0.127	0.111	0.162	0.154	0.115	0.134	17.4
32	Phenol-d5	S	1.530	1.588	1.731	1.725	1.513	1.617	6.5
33	Pyrene-d10	S	0.788	0.871	0.810	0.701	0.683	0.771	10.1
34	Anthracene-d10	S	0.954	0.880	0.889	0.900	0.837	0.892	4.7
35	1,4-Dibromobenzene-d4	S	0.783	0.619	0.776	0.715	0.574	0.693	13.5
36	1,3,5-Trichlorobenzene-d3	S	0.290	0.256	0.281	0.275	0.241	0.269	7.5

JMB

DAILY CALIBRATION CHECK

DATE : 25-Se

TIME : 1

PB 9-26-91

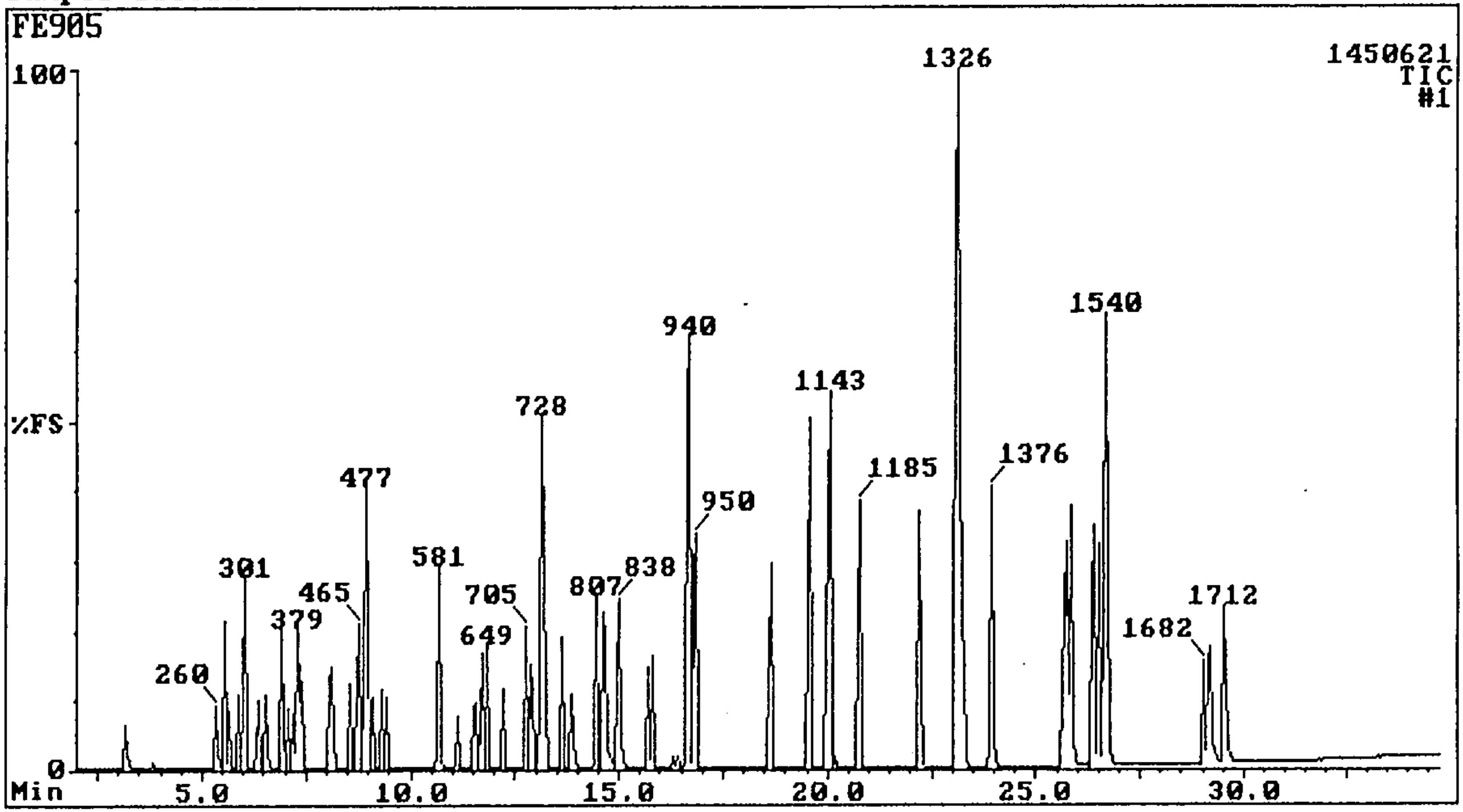
DO 9-26-91

LAB FILE ID: FE901

	COMPOUND	FLAG	RF MEAN	RF 50	%D
3	Naphthalene		0.981	0.941	4.1
4	2-Methylnaphthalene		0.816	0.794	2.6
6	2-Chloronaphthalene		0.907	0.924	-1.8
7	Acenaphthylene		1.556	1.540	1.1
8	Acenaphthene	C	1.006	0.978	2.8
9	Fluorene		1.147	1.142	0.4
11	Phenanthrene		0.879	0.867	1.4
12	Anthracene		0.876	0.872	0.4
13	Fluoranthene	C	1.342	1.300	3.1
16	Pyrene		0.995	1.162	-16.8
17	Benzo(a)anthracene		1.062	1.099	-3.5
18	Chrysene		1.010	1.018	-0.8
20	Benzo(b)fluoranthene		1.070	0.974	9.0
21	Benzo(k)fluoranthene		0.999	1.193	-19.4
22	Benzo(e)pyrene		0.964	0.975	-1.1
23	Benzo(a)pyrene	C	0.972	1.023	-5.2
24	Perylene		0.586	0.580	1.0
25	Indeno(1,2,3-cd)pyrene		0.820	0.810	1.2
26	Dibenz(a,h)anthracene		0.877	0.843	3.9
27	Benzo(g,h,i)perylene		0.904	0.921	-1.9
28	Pentachlorophenol	C	0.114	0.121	-5.8
15	Terphenyl-d14	S	0.738	0.818	-10.8
29	Nitrobenzene-d5	S	0.507	0.492	2.9
30	2-Fluorobiphenyl	S	0.849	0.864	-1.7
31	2,4,6-Tribromophenol	S	0.134	0.111	17.2
32	Phenol-d5	S	1.617	1.588	1.8
33	Pyrene-d10	S	0.771	0.871	-13.1
34	Anthracene-d10	S	0.892	0.880	1.3
35	1,4-Dibromobenzene-d4	S	0.693	0.619	10.8
36	1,3,5-Trichlorobenzene-d3	S	0.269	0.256	4.9

25-Sep-91 11:36 Triangle Labs, Inc. (919) 544-5729

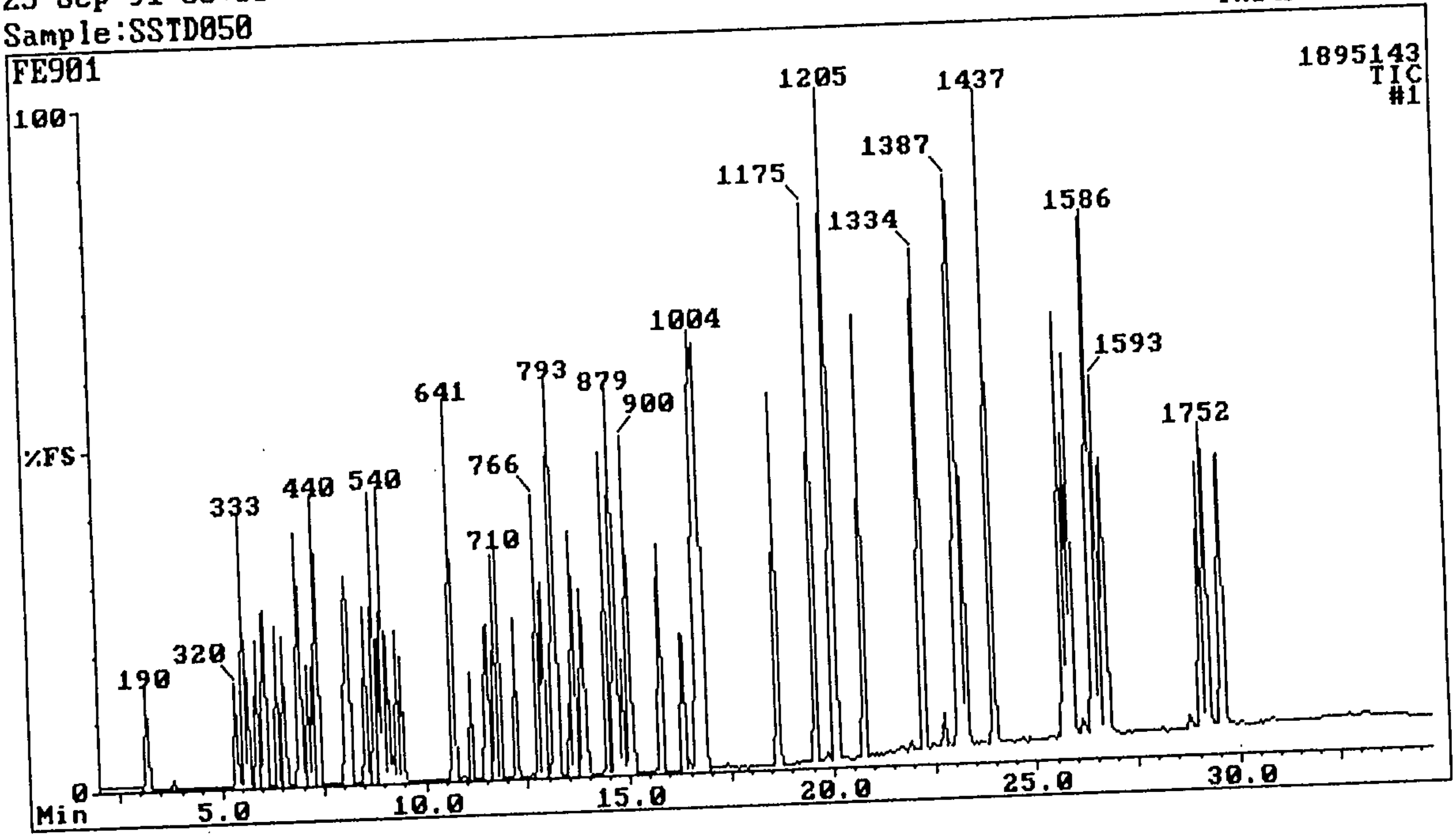
Sample:SSTD020 Instrument F



No.	MAT	FOR	REV	Delta	Area	P.Flags	Scan	QM	Name
1	100	85	100	-1	133290	bb	301	152	1,4 Dichlorobenzene-d4
2	100	87	91	1	499180	bb	477	136	Naphthalene-d8
3	100	93	96	-1	258510	bb	479	128	Naphthalene
4	99	71	88	0	202750	bb	581	142	2-Methylnaphthalene
5	100	94	96	0	343080	bb	728	164	Acenaphthene-d10
6	100	92	95	0	161280	bb	649	162	2-Chloronaphthalene
7	100	95	98	-1	270950	bb	705	152	Acenaphthylene
8	100	88	98	-1	179790	bb	732	153	Acenaphthene
9	100	93	95	-1	209040	bb	807	166	Fluorene
10	100	93	97	0	781260	vv	940	188	Phenanthrene-d10
11	100	95	98	-2	363540	vv*	942	178	Phenanthrene
12	100	94	97	-1	362460	vb	950	178	Anthracene
13	100	96	98	-2	590440	bb	1113	202	Fluoranthene
14	89	73	93	-2	1163500	bv	1326	240	Chrysene-d12
15	100	94	98	1	452760	bb	1185	244	Terphenyl-d14
16	100	95	97	0	611140	bb	1143	202	Pyrene
17	100	81	97	0	590610	bv*	1324	228	Benzo(a)anthracene
18	100	94	99	0	627860	vb	1329	228	Chrysene
19	100	88	92	1	1071800	bb	1540	264	Perylene-d12
20	100	89	93	-2	532110	bv	1485	252	Benzo(b)fluoranthene
21	100	93	95	-2	623110	vb	1490	252	Benzo(k)fluoranthene
22	100	93	99	-1	510600	bv	1523	252	Benzo(e)pyrene
23	100	94	100	-2	513150	vv	1530	252	Benzo(a)pyrene
24	100	82	99	-1	353140	vb	1543	252	Perylene
25	97	90	90	-2	283810	bv	1681	276	Indeno(1,2,3-cd)pyrene
26	100	86	87	-1	344260	bv	1690	278	Dibenz(a,h)anthracene
27	98	89	93	-2	399360	vb	1712	276	Benzo(g,h,i)perylene
28	76	57	64	0	24712	bb	919	266	Pentachlorophenol
29	87	58	91	-1	131750	bb	380	82	Nitrobenzene-d5
30	100	95	97	-1	158960	bb	642	172	2-Fluorobiphenyl
31	84	68	76	-1	21848	bb	843	330	2,4,6-Tribromophenol
32	98	73	95	-1	101960	bb	271	99	Phenol-d5
33	100	91	97	0	458140	bb	1140	212	Pyrene-d10
34	100	91	97	-2	372680	vb	947	188	Anthracene-d10
35	100	92	95	1	52172	bb	485	240	1,4-Dibromobenzene-d4
36	95	69	83	0	72372	bb	427	185	1,3,5-Trichlorobenzene-(

25-Sep-91 08:33 Triangle Labs, Inc. (919) 544-5729

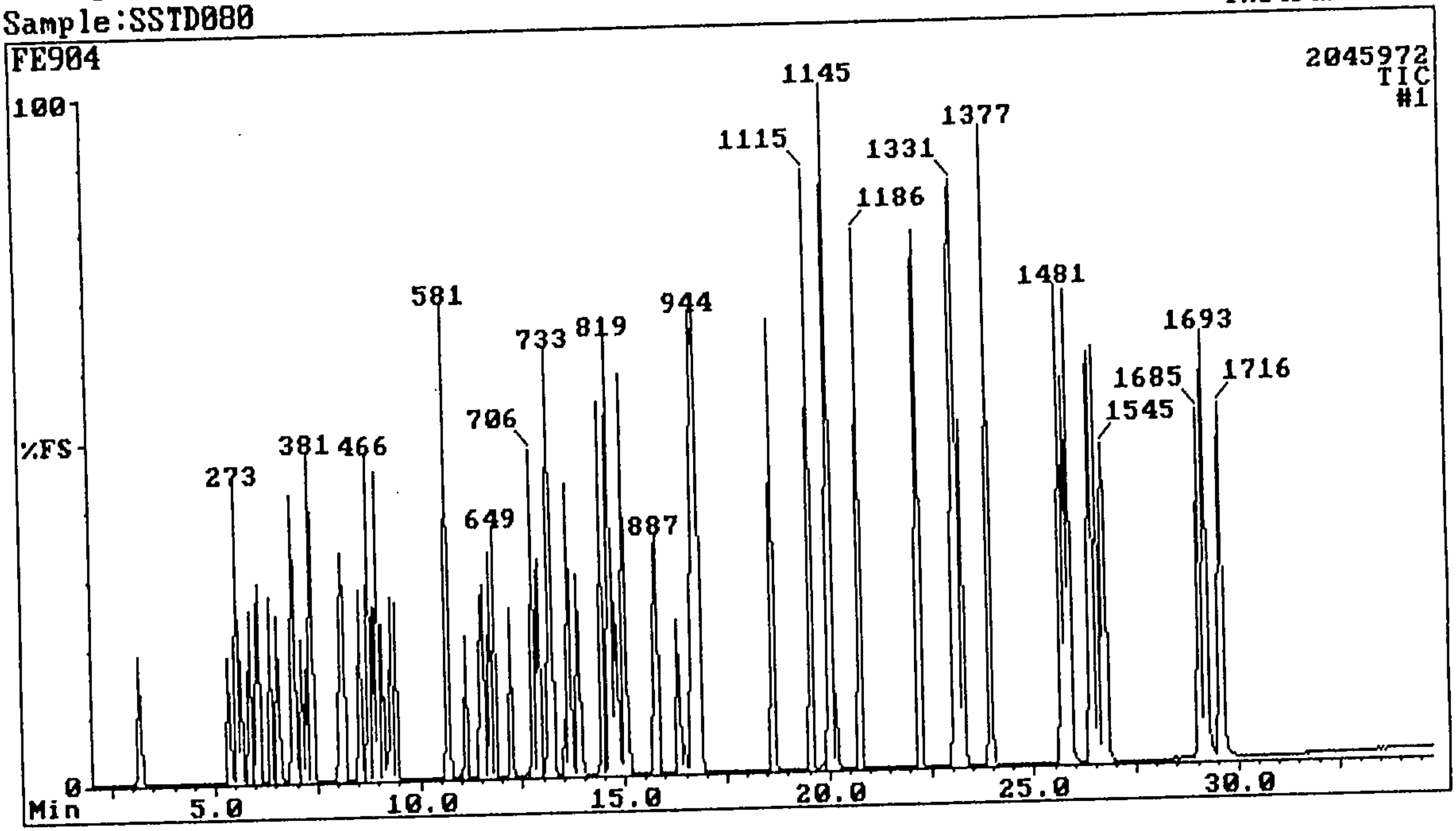
Sample:SSTD050 Instrument F



No.	MAT	FOR	REV	Delta	Area	P.Flags	Scan	QM	Name
1	100	82	99	0	153760	bb	362	152	1,4 Dichlorobenzene-d4
2	100	89	95	0	589980	bb	537	136	Naphthalene-d8
3	100	91	95	1	693840	bb	540	128	Naphthalene
4	58	72	90	5	585700	bb	641	142	2-Methylnaphthalene
5	100	93	98	0	384900	bb	788	164	Acenaphthene-d10
6	100	94	97	-2	444400	bb	709	162	2-Chloronaphthalene
7	100	94	97	-1	740720	bb	766	152	Acenaphthylene
8	100	87	97	1	470470	bb	793	153	Acenaphthene
9	93	93	96	3	549220	bb	868	166	Fluorene
10	100	91	97	0	896170	bv	1000	188	Phenanthrene-d10
11	100	93	97	1	970800	vv*	1004	178	Phenanthrene
12	100	91	97	0	977240	vb*	1011	178	Anthracene
13	86	94	97	4	1456600	vv	1175	202	Fluoranthene
14	100	71	93	0	1004200	bb	1388	240	Chrysene-d12
15	100	89	98	0	1026700	bb	1246	244	Terphenyl-d14
16	100	93	97	-1	1458600	bb	1205	202	Pyrene
17	100	85	97	0	1379800	bv	1386	228	Benzo(a)anthracene
18	100	90	98	-1	1277600	vb	1391	228	Chrysene
19	100	80	93	0	874530	bb	1601	264	Perylene-d12
20	100	87	95	0	1064700	bv	1548	252	Benzo(b)fluoranthene
21	100	89	96	0	1303900	vv	1553	252	Benzo(k)fluoranthene
22	99	60	99	0	1065700	bv*	1585	252	Benzo(e)pyrene
23	100	86	100	0	1118100	vv	1593	252	Benzo(a)pyrene
24	100	84	99	0	634220	vv	1605	252	Perylene
25	100	88	95	1	885200	bv	1744	276	Indeno(1,2,3-cd)pyrene
26	100	84	93	1	921530	vv	1752	278	Dibenz(a,h)anthracene
27	100	86	95	1	1007200	vv	1775	276	Benzo(g,h,i)perylene
28	100	84	96	0	135020	bb	979	266	Pentachlorophenol
29	71	51	93	-3	363100	bb	441	82	Nitrobenzene-d5
30	100	91	97	-1	415810	bb	703	172	2-Fluorobiphenyl
31	68	77	91	5	53308	bb	904	330	2,4,6-Tribromophenol
32	89	60	94	0	305140	bb	333	99	Phenol-d5
33	100	82	98	-1	1093900	bb	1202	212	Pyrene-d10
34	100	86	97	1	986240	vb	1009	188	Anthracene-d10
35	100	82	94	-1	118890	bb	546	240	1,4-Dibromobenzene-d4
36	91	71	85	-1	188430	bb	487	185	1,3,5-Trichlorobenzene-(

25-Sep-91 10:51 Triangle Labs, Inc. (919) 544-5729

Sample:SSTD080 Instrument F

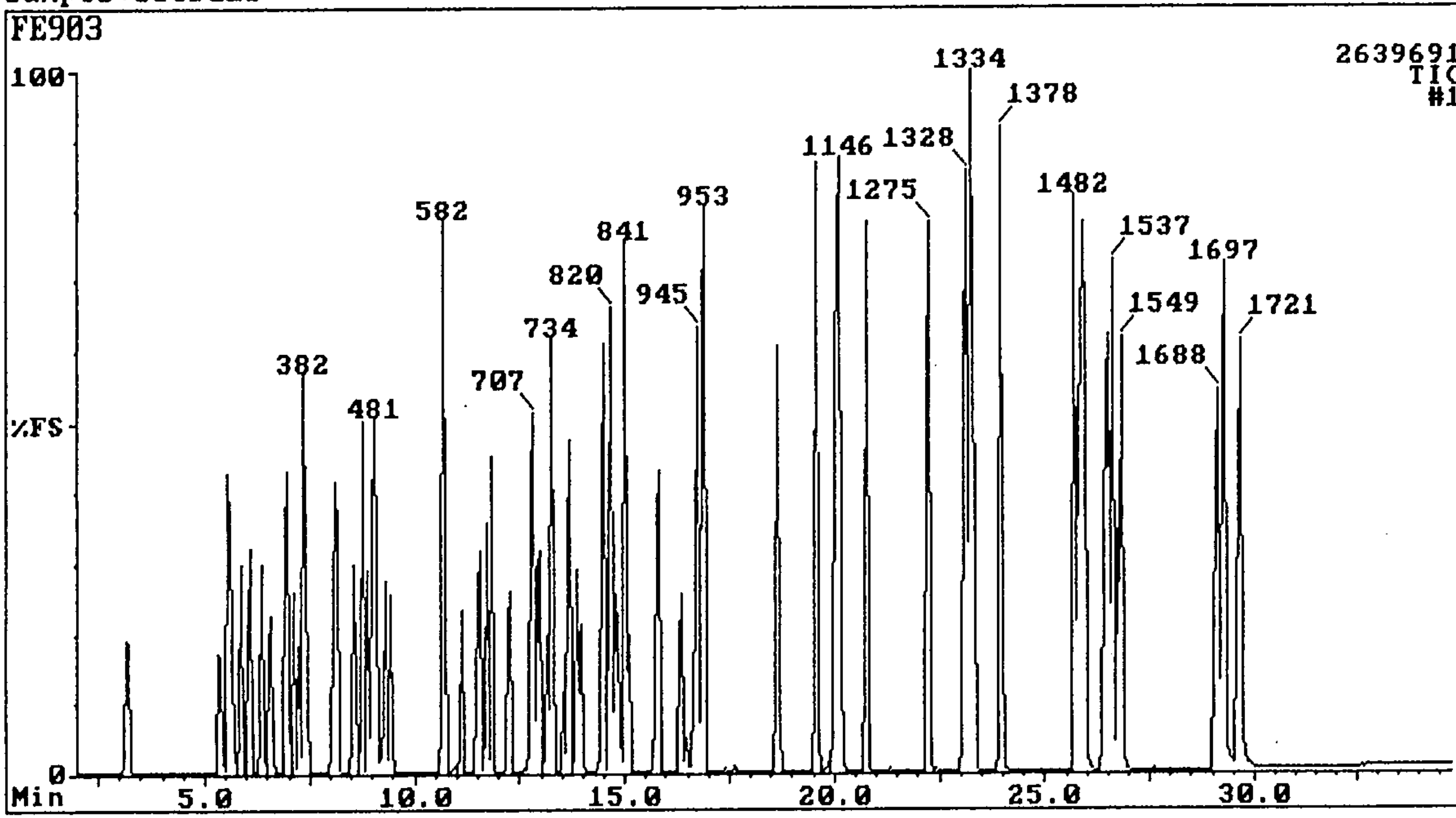


QUAN DB : FE904 LAB-BASE QUAN 25-Sep-91 13:3

lo.	MAT	FOR	REV	Delta	Area	F.Flags	Scan	QM	Name
1	100	79	100	-1	111230	bb	301	152	1,4 Dichlorobenzene-d4
2	100	82	92	1	415410	bb	477	136	Naphthalene-d8
3	100	92	95	0	810870	bb	480	128	Naphthalene
4	95	65	87	0	666200	bb	581	142	2-Methylnaphthalene
5	100	89	97	0	281680	bb	728	164	Acenaphthene-d10
6	100	93	96	0	515200	bb	649	162	2-Chloronaphthalene
7	100	93	97	0	871840	bb	706	152	Acenaphthylene
8	100	84	97	0	576910	bb	733	153	Acenaphthene
9	100	93	97	0	645700	bb	808	166	Fluorene
10	100	90	96	0	696750	vv	940	188	Phenanthrene-d10
11	100	93	97	0	1229600	vv*	944	178	Phenanthrene
12	100	93	98	0	1195500	vb*	951	178	Anthracene
13	100	95	98	0	1845100	vv	1115	202	Fluoranthene
14	84	51	94	-1	864770	bv	1327	240	Chrysene-d12
15	100	90	98	1	1367600	bb	1186	244	Terphenyl-d14
16	100	95	97	1	1748100	bb	1145	202	Pyrene
17	100	91	97	0	1812300	bv*	1325	228	Benzo(a)anthracene
18	100	93	98	1	1774700	vb	1331	228	Chrysene
19	100	86	92	1	873250	bb	1541	264	Perylene-d12
20	100	92	95	0	1795800	bv	1488	252	Benzo(b)fluoranthene
21	100	93	96	0	1759000	vv	1493	252	Benzo(k)fluoranthene
22	100	93	99	1	1652800	bv*	1526	252	Benzo(e)pyrene
23	100	93	100	0	1706900	vv*	1533	252	Benzo(a)pyrene
24	100	92	99	0	990800	vv	1545	252	Perylene
25	100	94	96	1	1528300	bv	1685	276	Indeno(1,2,3-cd)pyrene
26	100	91	95	1	1645500	vv	1693	278	Dibenz(a,h)anthracene
27	100	92	94	1	1698700	b?	1716	276	Benzo(g,h,i)perylene
28	100	83	95	0	180300	bv	919	266	Pentachlorophenol
29	89	60	94	0	447490	bb	381	82	Nitrobenzene-d5
30	100	89	96	0	484710	bb	643	172	2-Fluorobiphenyl
31	100	79	92	0	91384	bb	844	330	2,4,6-Tribromophenol
32	81	51	89	1	385040	bb	273	99	Phenol-d5
33	100	78	96	1	1401000	bb	1142	212	Pyrene-d10
34	100	84	97	0	1238400	vb	949	188	Anthracene-d10
35	100	89	96	1	172560	bb	485	240	1,4-Dibromobenzene-d4
36	95	67	85	0	233830	bb	427	185	1,3,5-Trichlorobenzene-

25-Sep-91 10:06 Triangle Labs, Inc. (919) 544-5729

Sample:SSTD120 Instrument F



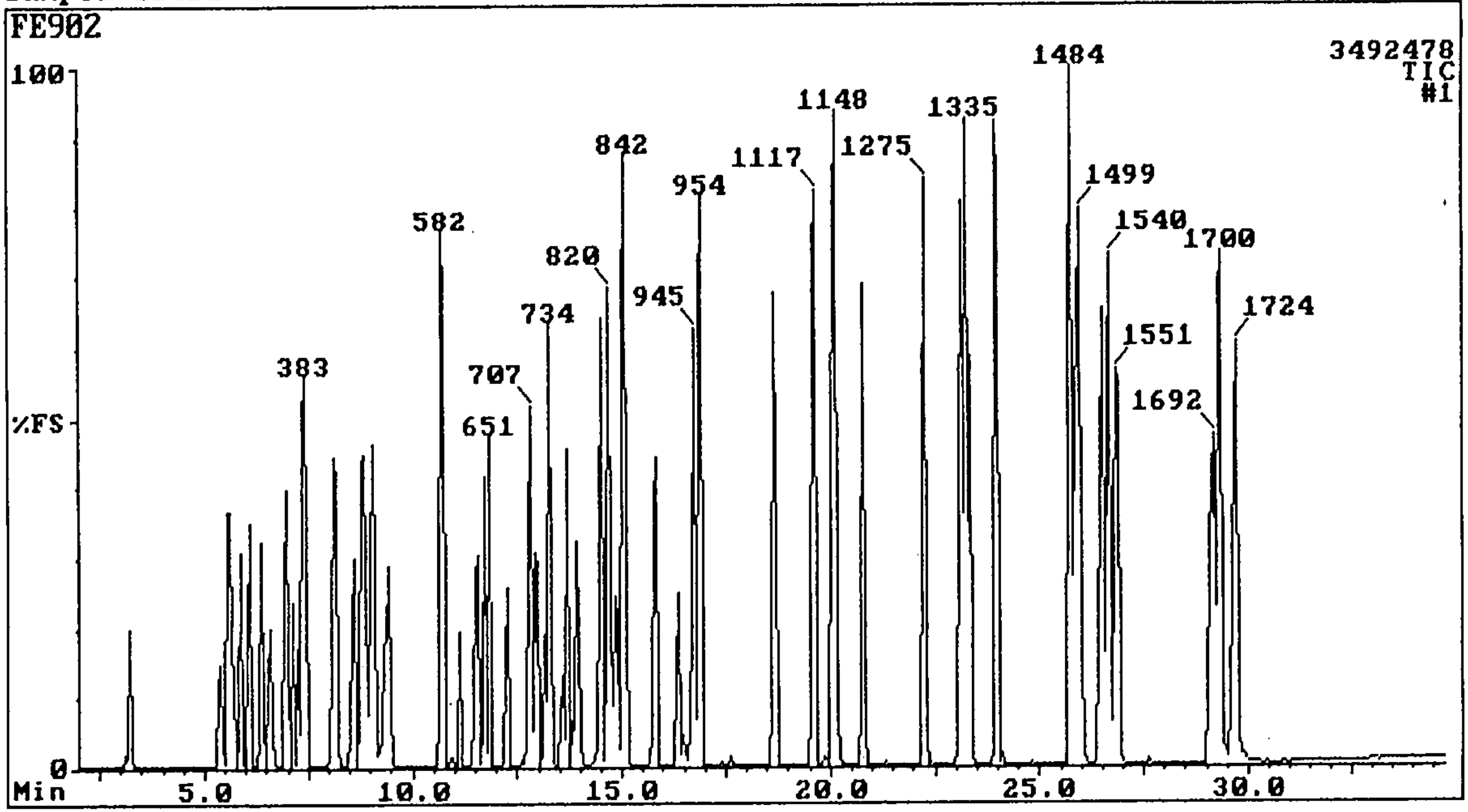
JMS

QUAN DB : FE903 LAB-BASE QUAN 25-Sep-91 13:

No.	MAT	FOR	REV	Delta	Area	P.Flags	Scan	QM	Name
1	100	61	99	0	113460	bb	302	152	1,4 Dichlorobenzene-d4
2	94	69	92	1	420650	bb	478	136	Naphthalene-d8
3	100	92	95	0	1248000	bb	481	128	Naphthalene
4	98	68	88	0	1024900	bb	582	142	2-Methylnaphthalene
5	100	87	97	-1	289100	bb	728	164	Acenaphthene-d10
6	100	92	96	1	781230	bb	650	162	2-Chloronaphthalene
7	100	93	97	1	1356300	bb	707	152	Acenaphthylene
8	100	90	98	1	869320	bb	734	153	Acenaphthene
9	100	92	96	1	976460	bb	809	166	Fluorene
10	100	87	96	0	646990	vv	940	188	Phenanthrene-d10
11	100	94	98	1	1705600	vv	945	178	Phenanthrene
12	100	93	98	2	1732600	vb	953	178	Anthracene
13	100	95	98	1	2623400	vv	1116	202	Fluoranthene
14	88	59	93	1	953500	bb	1329	240	Chrysene-d12
15	100	90	98	0	1928200	bb	1187	244	Terphenyl-d14
16	100	94	97	0	2447200	bb	1146	202	Pyrene
17	100	91	97	0	3106800	bv*	1327	228	Benzo(a)anthracene
18	100	92	99	2	2818200	vb	1334	228	Chrysene
19	94	83	92	2	1072400	bb	1544	264	Perylene-d12
20	100	92	95	0	3636400	b! ✓ JMS 9-25-91	1491	252	Benzo(b)fluoranthene
21	100	93	96	0	2969800	!b ✓	1496	252	Benzo(k)fluoranthene
22	100	93	99	1	3113500	bv	1529	252	Benzo(e)pyrene
23	100	92	100	1	3188800	vv	1537	252	Benzo(a)pyrene
24	100	92	99	1	1827400	vv	1549	252	Perylene
25	100	93	96	1	3061500	bv	1688	276	Indeno(1,2,3-cd)pyrene
26	99	90	95	2	3169500	vv	1697	278	Dibenz(a,h)anthracene
27	92	92	94	3	3136300	b? ✓ JMS 9-25-91	1721	276	Benzo(g,h,i)perylene
28	100	83	97	1	266080	bb	920	266	Pentachlorophenol
29	87	56	94	0	676840	bb	382	82	Nitrobenzene-d5
30	100	91	97	0	715050	bb	643	172	2-Fluorobiphenyl
31	99	79	92	1	133520	bb	845	330	2,4,6-Tribromophenol
32	81	50	89	1	587120	bb	274	99	Phenol-d5
33	100	83	98	0	2005700	bb	1143	212	Pyrene-d10
34	100	80	97	1	1746700	vb	950	188	Anthracene-d10
35	100	87	95	0	243420	bb	486	240	1,4-Dibromobenzene-d4
36	89	58	85	0	347460	bb	428	185	1,3,5-Trichlorobenzene-

25-Sep-91 09:30 Triangle Labs, Inc. (919) 544-5729

Sample:SSTD160 Instrument F

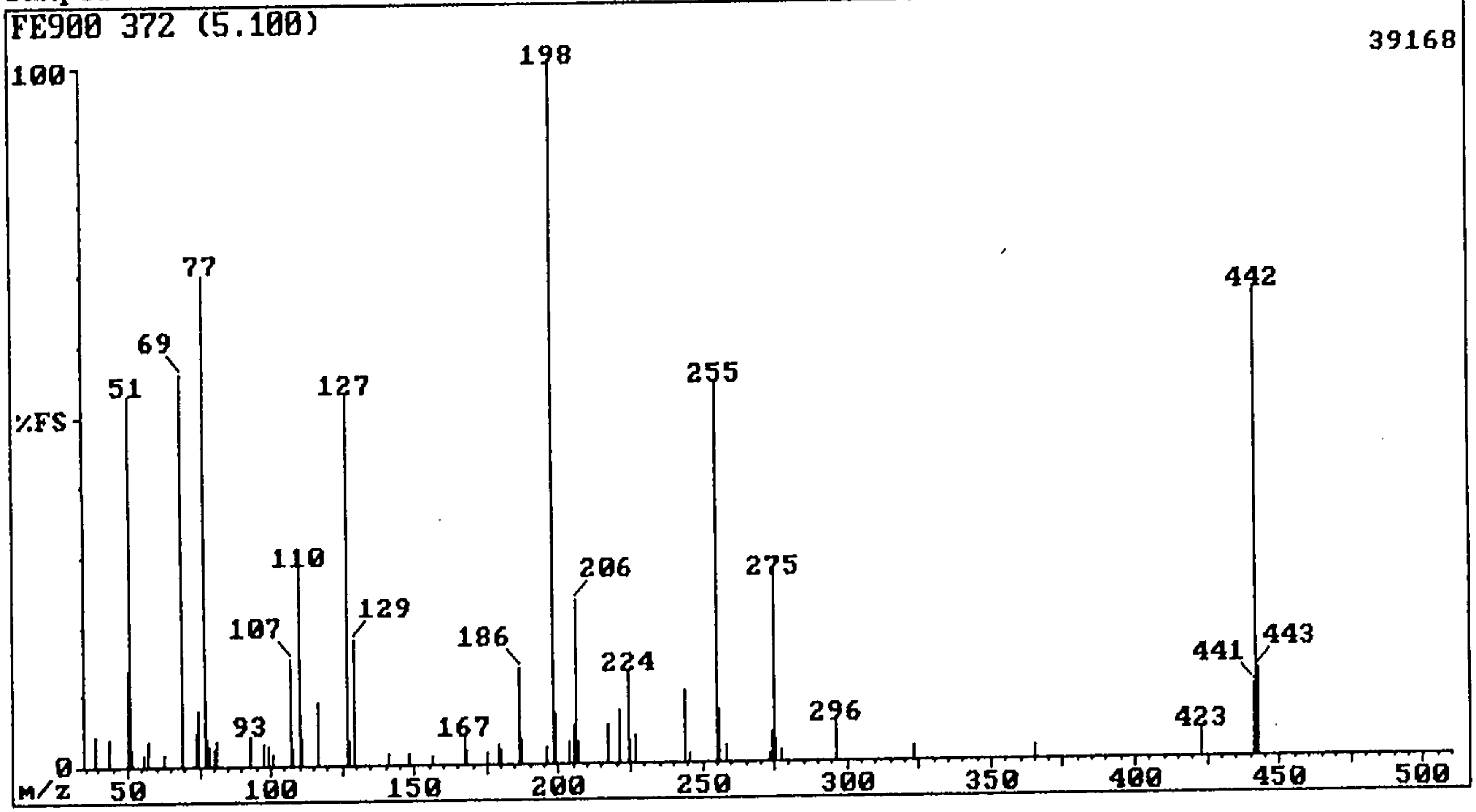


QUAN DB : FE902   LAB-BASE QUAN   25-Sep-91   13:3

o.	MAT	FOR	REV	Delta	Area	P.Flags	Scan	QM	Name
1	100	61	99	0	135480	bb	302	152	1,4 Dichlorobenzene-d4
2	95	69	94	1	504960	bb	478	136	Naphthalene-d8
3	100	93	96	0	1949400	bb	481	128	Naphthalene
4	99	69	90	0	1732600	bv	582	142	2-Methylnaphthalene
5	100	82	97	0	345920	vb	729	164	Acenaphthene-d10
6	100	93	96	1	1184000	bb	651	162	2-Chloronaphthalene
7	100	94	98	0	2147100	bb	707	152	Acenaphthylene
8	100	90	98	0	1352700	bb	734	153	Acenaphthene
9	100	92	96	1	1523100	bb	810	166	Fluorene
10	100	80	96	0	751810	vv	941	188	Phenanthrene-d10
11	100	94	98	0	2516600	vv	945	178	Phenanthrene
12	100	94	98	2	2496100	vb	954	178	Anthracene
13	100	95	98	1	3680800	vv	1117	202	Fluoranthene
14	81	46	94	1	1026400	bb	1330	240	Chrysene-d12
15	100	90	98	-1	2589000	bb	1187	244	Terphenyl-d14
16	100	94	97	1	3672800	bb	1148	202	Pyrene
17	100	91	97	0	4357600	bv*	1328	228	Benzo(a)anthracene
18	100	93	99	2	3864800	vb	1335	228	Chrysene
19	86	82	93	3	1224200	bb	1546	264	Perylene-d12
20	100	92	95	1	5998900	b!*	1494	252	Benzo(b)fluoranthene
21	100	93	96	1	3466300	!b	1499	252	Benzo(k)fluoranthene
22	100	93	99	2	4795300	bv	1532	252	Benzo(e)pyrene
23	100	92	100	2	4462300	vv	1540	252	Benzo(a)pyrene
24	100	92	99	1	2726000	vv	1551	252	Perylene
25	94	94	97	3	4571700	bv	1692	276	Indeno(1,2,3-cd)pyrene
26	91	90	95	3	4763800	bv	1700	278	Dibenz(a,h)anthracene
27	92	92	95	3	4430500	bv	1724	276	Benzo(g,h,i)perylene
28	100	83	97	0	358600	bv	920	266	Pentachlorophenol
29	78	50	95	1	887560	bb	383	82	Nitrobenzene-d5
30	100	90	97	0	1067600	bb	644	172	2-Fluorobiphenyl
31	99	78	92	1	158400	bb	846	330	2,4,6-Tribromophenol
32	75	51	89	2	819940	bb	275	99	Phenol-d5
33	100	76	96	0	2803000	bb	1144	212	Pyrene-d10
34	100	77	97	1	2516900	vb	951	188	Anthracene-d10
35	100	86	96	0	311280	bb	486	240	1,4-Dibromobenzene-d4
36	88	55	85	0	486660	bb	428	185	1,3,5-Trichlorobenzene-

25-Sep-91 07:56 Triangle Labs, Inc. (919) 544-5729

Sample:DFTPP Instrument F



FE900 372 (5.100)

Pk#	Mass	Abs Int	Rel Int	Pk#	Mass	Abs Int	Rel Int	Pk#	Mass	Abs Int	Rel Int	Pk#	Mass	Abs Int	Rel Int	Pk#	Mass	Abs Int	Rel Int
1	39	1696	4.33	15	80	896	2.29	29	141	616	1.57	43	205	2160	5.51	57	274	1664	4.25
2	44	1536	3.92	16	81	1328	3.39	30	148	628	1.60	44	206	9088	23.20	58	275	10304	26.31
3	50	5376	13.73	17	93	1696	4.33	31	156	516	1.32	45	207	1184	3.02	59	276	1264	3.23
4	51	20736	52.94	18	98	1232	3.15	32	167	1600	4.08	46	217	2128	5.43	60	277	668	1.71
5	52	944	2.41	19	99	1056	2.70	33	168	768	1.96	47	221	2864	7.31	61	296	2112	5.39
6	56	548	1.40	20	101	636	1.62	34	175	568	1.45	48	224	4992	12.75	62	323	708	1.81
7	57	1360	3.47	21	107	6016	15.36	35	179	1072	2.74	49	225	1152	2.94	63	365	736	1.88
8	63	572	1.46	22	108	864	2.21	36	180	828	2.11	50	227	1520	3.88	64	423	1472	3.76
9	69	22016	56.21	23	110	11072	28.27	37	186	5376	13.73	51	244	3904	9.97	65	441	4000	10.21
10	74	1840	4.70	24	111	1456	3.72	38	187	1440	3.68	52	246	504	1.29	66	442	26112	66.67
11	75	2976	7.60	25	117	3520	8.99	39	196	888	2.27	53	255	21248	54.25	67	443	4928	12.58
12	77	27392	69.93	26	127	20736	52.94	40	198	39168	100.00	54	256	2944	7.52				
13	78	1600	4.08	27	128	1424	3.64	41	199	2768	7.07	55	258	928	2.37				
14	79	1120	2.86	28	129	6976	17.81	42	204	1200	3.06	56	273	528	1.35				

DFTPP TUNE CHECK REPORT

Raw Data File: FE900
Date: 25-Sep-91
Time: 07:56

M/E	ION ABUNDANCE CRITERIA	RELATIVE ABUNDANCE	TUNE
51	30.0 - 60.0% of mass 198	52.94	PASS
68	Less than 2.0% of mass 69	0.00(0.0)1	PASS
69	Mass 69 relative abundance	56.21	PASS
70	Less then 2.0% of mass 69	0.00(0.0)1	PASS
127	40.0 - 60.0% of mass 198	52.94	PASS
197	Less than 1% of mass 198	0.00	PASS
198	Base peak, 100% relative abundance	100.00	PASS
199	5 - 9% of mass 198	7.07	PASS
275	10 - 30% of mass 198	26.31	PASS
365	Greater than 1% of mass 198	1.88	PASS
441	Present, but less then mass 443	10.21	PASS
442	Greater than 40% of mass 198	66.67	PASS
443	17 - 23% of mass 442	12.58(18.9)2	PASS

JMB

INITIAL CALIBRATION CHECK

DATE : 19-Se

TIME : 1

JB
9-20-91

LAB FILE ID: RF20 =FE812 RF50 =FE807 RF80 =FE811
RF120=FE810 RF160=FE809

	COMPOUND	FLAG	RF 20NG	RF 50NG	RF 80NG	RF 120NG	RF 160NG	RF MEAN	%RS
3	Naphthalene		0.938	0.910	0.933	0.945	0.934	0.932	1.
4	2-Methylnaphthalene		0.558	0.719	0.609	0.547	0.768	0.640	15.
6	2-Chloronaphthalene		0.954	0.933	0.963	0.966	0.947	0.952	1.
7	Acenaphthylene		1.505	1.512	1.545	1.614	1.564	1.548	2.
8	Acenaphthene	C	1.036	1.007	1.034	1.073	1.042	1.038	2.
9	Fluorene		0.922	0.941	0.980	1.045	1.091	0.996	7.
11	Phenanthrene		1.056	1.077	1.010	0.946	0.894	0.997	7.
12	Anthracene		1.068	1.018	0.999	0.888	0.838	0.962	9.
13	Fluoranthene	C	1.085	1.170	1.192	1.020	0.980	1.089	8.
16	Pyrene		0.853	0.938	0.909	0.925	0.892	0.903	3.
17	Benzo(a)anthracene		0.990	1.023	1.049	1.080	1.049	1.038	3.
18	Chrysene		1.023	1.040	1.064	1.043	0.967	1.027	3.
20	Benzo(b)fluoranthene		0.871	0.883	0.872	0.916	0.967	0.902	4.
21	Benzo(k)fluoranthene		1.064	0.978	1.040	0.983	0.900	0.993	6.
22	Benzo(e)pyrene		0.856	0.849	0.915	0.933	0.922	0.895	4.
23	Benzo(a)pyrene	C	0.912	0.945	0.976	0.999	0.930	0.952	3.
24	Perylene		0.643	0.563	0.586	0.570	0.550	0.582	6.
25	Indeno(1,2,3-cd)pyrene		0.634	0.860	0.903	0.939	0.942	0.855	15.
26	Dibenz(a,h)anthracene		0.772	0.923	0.981	1.066	1.017	0.952	11.
27	Benzo(g,h,i)perylene		0.927	0.962	1.037	1.080	0.995	1.000	6.
28	Pentachlorophenol	C	0.079	0.090	0.093	0.081	0.073	0.083	9.
15	Terphenyl-d14	S	0.565	0.629	0.611	0.649	0.602	0.611	5.
29	Nitrobenzene-d5	S	0.297	0.254	0.269	0.283	0.280	0.277	5.
30	2-Fluorobiphenyl	S	0.876	0.896	0.907	0.908	0.858	0.889	2.
31	2,4,6-Tribromophenol	S	0.074	0.078	0.081	0.093	0.094	0.084	10.
32	Phenol-d5	S	1.460	1.196	1.314	1.337	1.402	1.342	7.
33	Pyrene-d10	S	0.590	0.655	0.619	0.677	0.649	0.638	5.
34	Anthracene-d10	S	0.942	0.924	0.891	0.748	0.734	0.848	11.
35	1,4-Dibromobenzene-d4	S	0.413	0.470	0.478	0.477	0.486	0.465	6.
36	1,3,5-Trichlorobenzene-d3	S	0.197	0.207	0.212	0.213	0.203	0.206	3.

DAILY CALIBRATION CHECK

DATE : 19-Ser

TIME : 17

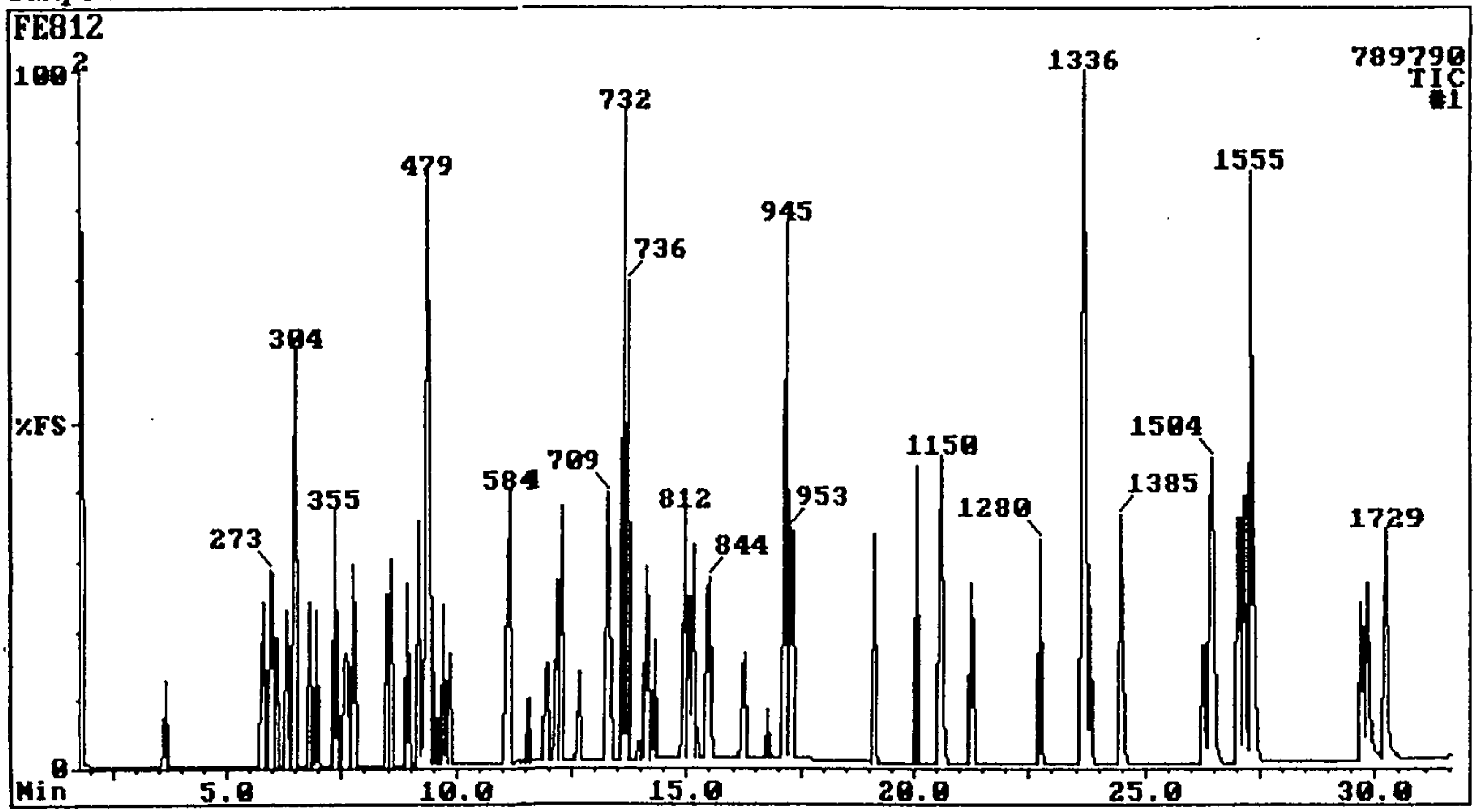
LAB FILE ID: FE807

JB
9-20-91

	COMPOUND	FLAG	RF MEAN	RF 50	%D
3	Naphthalene		0.932	0.910	2.3
4	2-Methylnaphthalene		0.640	0.719	-12.3
6	2-Chloronaphthalene		0.952	0.933	2.1
7	Acenaphthylene		1.548	1.512	2.3
8	Acenaphthene	C	1.038	1.007	3.0
9	Fluorene		0.996	0.941	5.5
11	Phenanthrene		0.997	1.077	-8.1
12	Anthracene		0.962	1.018	-5.8
13	Fluoranthene	C	1.089	1.170	-7.4
16	Pyrene		0.903	0.938	-3.8
17	Benzo(a)anthracene		1.038	1.023	1.4
18	Chrysene		1.027	1.040	-1.2
20	Benzo(b)fluoranthene		0.902	0.883	2.1
21	Benzo(k)fluoranthene		0.993	0.978	1.5
22	Benzo(e)pyrene		0.895	0.849	5.2
23	Benzo(a)pyrene	C	0.952	0.945	0.8
24	Perylene		0.582	0.563	3.3
25	Indeno(1,2,3-cd)pyrene		0.855	0.860	-0.5
26	Dibenz(a,h)anthracene		0.952	0.923	3.1
27	Benzo(g,h,i)perylene		1.000	0.962	3.8
28	Pentachlorophenol	C	0.083	0.090	-8.4
15	Terphenyl-d14	S	0.611	0.629	-2.9
29	Nitrobenzene-d5	S	0.277	0.254	8.1
30	2-Fluorobiphenyl	S	0.889	0.896	-0.8
31	2,4,6-Tribromophenol	S	0.084	0.078	7.4
32	Phenol-d5	S	1.342	1.196	10.9
33	Pyrene-d10	S	0.638	0.655	-2.7
34	Anthracene-d10	S	0.848	0.924	-9.0
35	1,4-Dibromobenzene-d4	S	0.465	0.470	-1.1
36	1,3,5-Trichlorobenzene-d3	S	0.206	0.207	-0.2

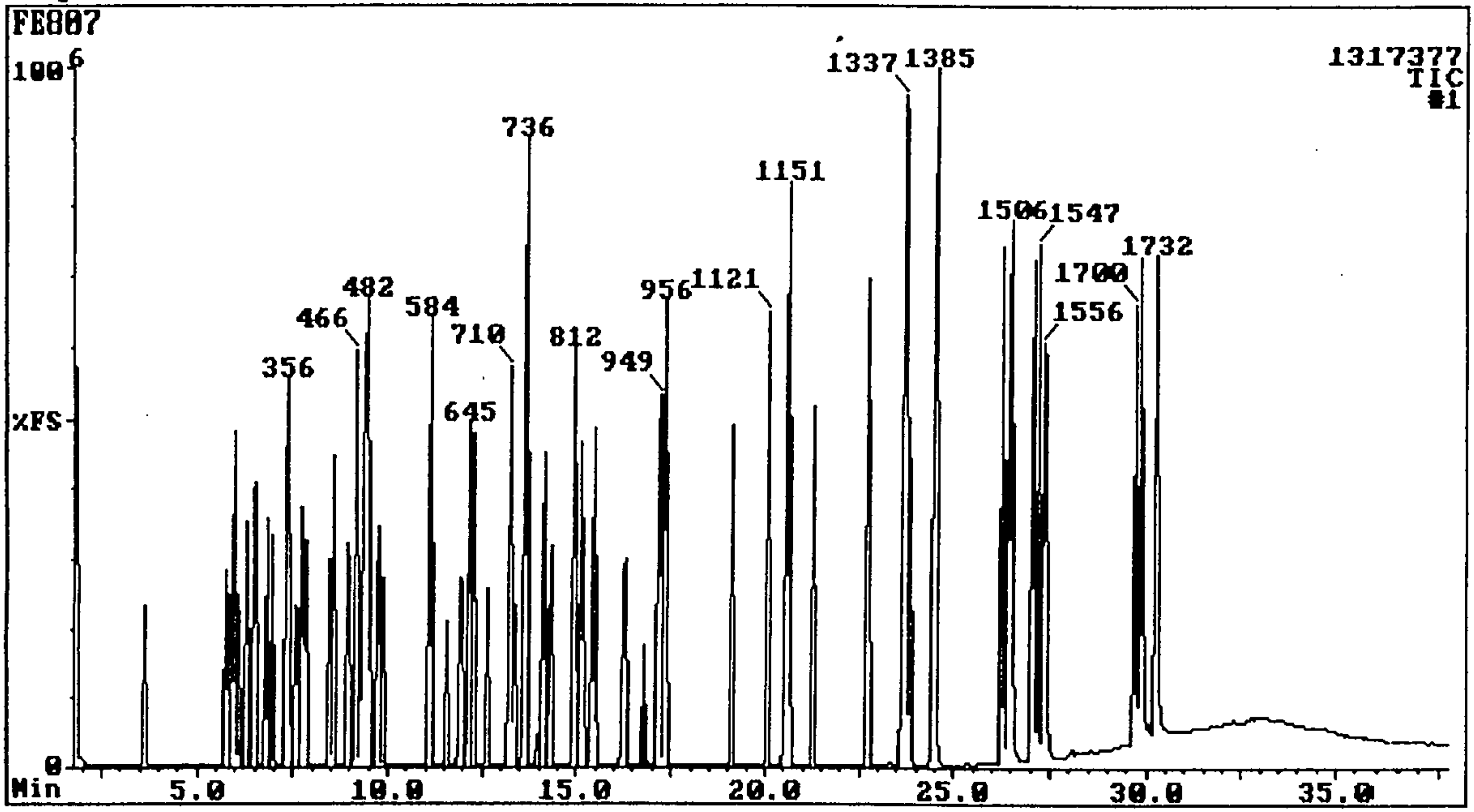
19-Sep-91 16:19 Triangle Labs, Inc. (919) 544-5729

Sample: SSTD020 Instrument F



No.	MAT	FOR	REV	Delta	Area	P.Flags	Scan	QM	Name
1	100	85	99	0	173730	bb	304	152	1,4 Dichlorobenzene-d4
2	100	93	96	-1	706000	bb	479	136	Naphthalene-d8
3	100	96	98	1	331010	bb	482	128	Naphthalene
4	100	92	97	1	196830	vb	584	142	2-Methylnaphthalene
5	100	96	98	1	365780	bb	732	164	Acenaphthene-d10
6	100	95	98	0	174400	bb	652	162	2-Chloronaphthalene
7	100	96	99	-1	275300	bb	709	152	Acenaphthylene
8	100	77	98	0	189380	bb	736	153	Acenaphthene
9	100	90	94	0	168680	bb	812	166	Fluorene
10	100	92	96	0	401890	bv	945	188	Phenanthrene-d10
11	100	94	98	0	212140	bv	948	178	Phenanthrene
12	100	94	99	-1	214540	vb*	955	178	Anthracene
13	100	94	96	-1	218050	bb	1120	202	Fluoranthene
14	100	81	92	-1	526970	bb	1336	240	Chrysene-d12
15	100	93	97	0	148910	bb	1191	244	Terphenyl-d14
16	100	93	95	0	224640	bb	1150	202	Pyrene
17	95	69	95	1	260820	bv	1335	228	Benzo(a)anthracene
18	100	94	100	0	269560	vb	1340	228	Chrysene
19	100	91	95	1	594540	bb	1555	264	Perylene-d12
20	95	87	90	-2	258970	bv	1499	252	Benzo(b)fluoranthene
21	99	91	93	-2	316250	vb	1504	252	Benzo(k)fluoranthene
22	100	93	98	-2	254480	bv*	1537	252	Benzo(e)pyrene
23	100	92	98	-2	271230	vv	1545	252	Benzo(a)pyrene
24	100	78	96	-1	191050	vb	1558	252	Perylene
25	97	90	90	-2	188530	bv	1698	276	Indeno(1,2,3-cd)pyrene
26	93	86	87	-2	229600	bv	1706	278	Dibenz(a,h)anthracene
27	89	88	92	-3	275440	vb	1729	276	Benzo(g,h,i)perylene
28	85	64	82	-1	15936	bb	922	266	Pentachlorophenol
29	100	91	95	1	104810	bb	382	82	Nitrobenzene-d5
30	100	93	97	-1	160170	bb	644	172	2-Fluorobiphenyl
31	76	53	68	-1	13608	bb	846	330	2,4,6-Tribromophenol
32	100	76	97	-1	126830	bv	272	99	Phenol-d5
33	100	93	97	0	155380	bb	1147	212	Pyrene-d10
34	100	89	97	0	189240	vb*	953	188	Anthracene-d10
35	100	93	94	-1	35856	bb	487	240	1,4-Dibromobenzene-d4
36	85	63	83	1	69536	bb	429	185	1,3,5-Trichlorobenzene-

19-Sep-91 12:17 Triangle Labs, Inc. (919) 544-5729
Sample: SSTD050 Instrument F

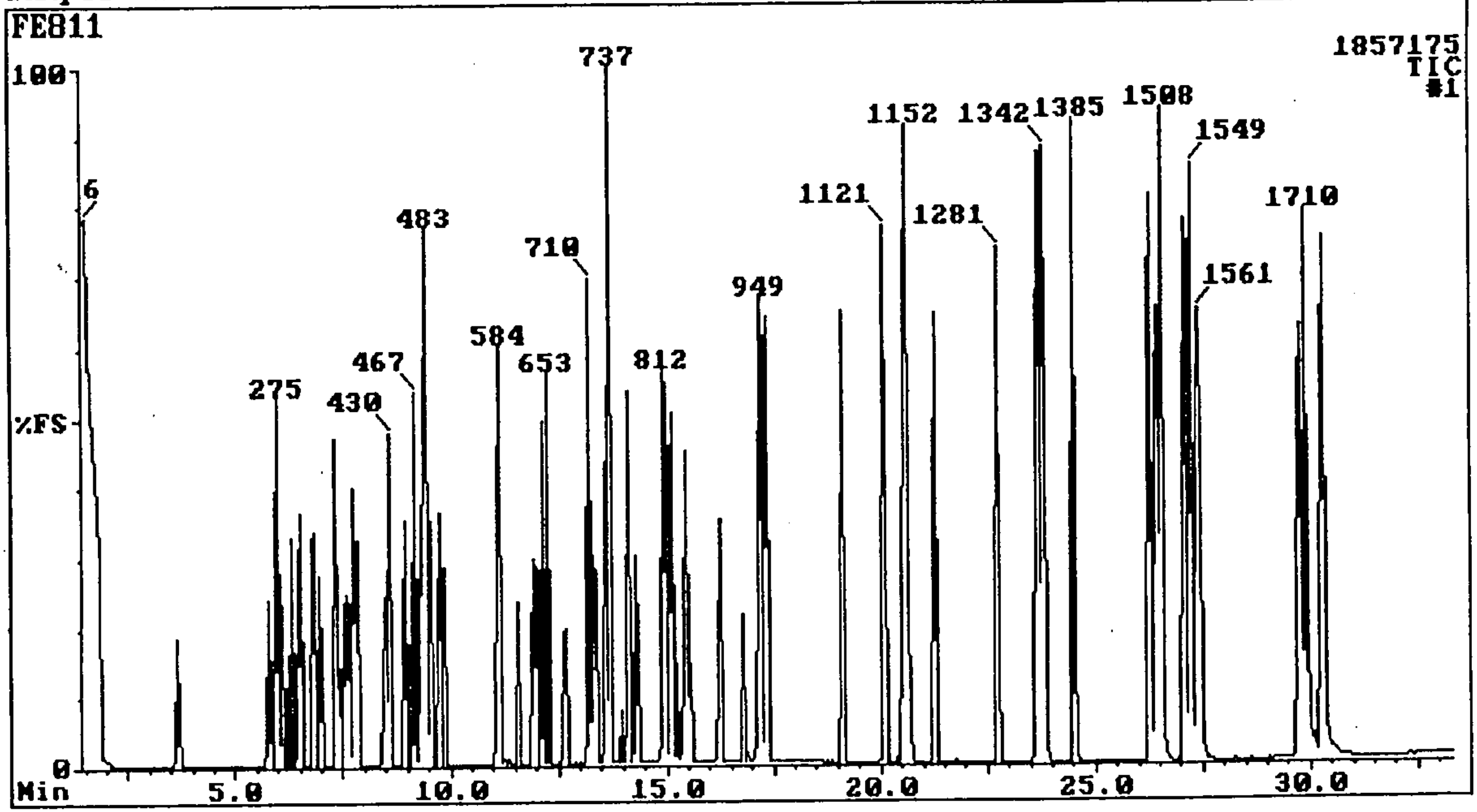


QUAN DB : FE807 LAB-BASE QUAN 19-Sep-91 14:

SSTO Ø5Ø

No.	MAT	FOR	REV	Delta	Area	F.Flags	Scan	QM	Name
1	100	82	98	0	194220	bb	304	152	1,4 Dichlorobenzene-d4
2	100	93	97	0	791950	bb	480	136	Naphthalene-d8
3	100	96	98	-2	901260	bb	482	128	Naphthalene
4	75	73	73	-9	711410	A	584	142	2-Methylnaphthalene
5	100	96	99	0	399470	bb	732	164	Acenaphthene-d10
6	100	97	98	8	465740	bb	652	162	2-Chloronaphthalene
7	100	96	99	2	755020	bb	710	152	Acenaphthylene
8	100	76	99	-2	502930	bb	736	153	Acenaphthene
9	94	96	98	-10	469630	bb	812	166	Fluorene
10	100	93	97	0	487620	vv*	945	188	Phenanthrene-d10
11	100	97	99	-2	656720	bv	948	178	Phenanthrene
12	100	96	98	-1	620220	vb	956	178	Anthracene
13	79	95	97	-15	713130	vb	1121	202	Fluoranthene
14	98	63	93	0	633900	bb	1337	240	Chrysene-d12
15	100	90	97	0	498240	bb	1192	244	Terphenyl-d14
16	96	95	97	9	743000	vb	1151	202	Pyrene
17	100	89	97	0	810910	bv	1335	228	Benzo(a)anthracene
18	100	94	99	1	823780	vb	1341	228	Chrysene
19	100	87	93	0	783720	bb	1555	264	Perylene-d12
20	100	91	94	2	865160	bv	1501	252	Benzo(b)fluoranthene
21	100	92	95	1	958390	vv	1506	252	Benzo(k)fluoranthene
22	100	92	98	0	831400	bv	1539	252	Benzo(e)pyrene
23	100	91	99	1	925600	vv	1547	252	Benzo(a)pyrene
24	100	89	98	0	551290	vv*	1559	252	Perylene
25	98	91	96	-7	842040	bv*	1700	276	Indeno(1,2,3-cd)pyrene
26	95	87	93	-7	903760	vv	1708	278	Dibenz(a,h)anthracene
27	94	89	95	-8	942420	bv	1732	276	Benzo(g,h,i)perylene
28	100	88	96	-3	54924	bb	923	266	Pentachlorophenol
29	75	92	95	16	251800	bb	382	82	Nitrobenzene-d5
30	100	95	99	5	447200	bb	645	172	2-Fluorobiphenyl
31	66	76	83	-15	38900	bb	847	330	2,4,6-Tribromophenol
32	100	79	97	-3	290350	bb	273	99	Phenol-d5
33	95	90	96	8	518770	bb	1148	212	Pyrene-d10
34	100	92	98	0	563310	vb*	953	188	Anthracene-d10
35	100	89	94	0	114050	bb	488	240	1,4-Dibromobenzene-d4
36	80	70	86	8	204720	bb	429	185	1,3,5-Trichlorobenzene-c

19-Sep-91 15:24 Triangle Labs, Inc. (919) 544-5729
Sample: SSTD080 Instrument F

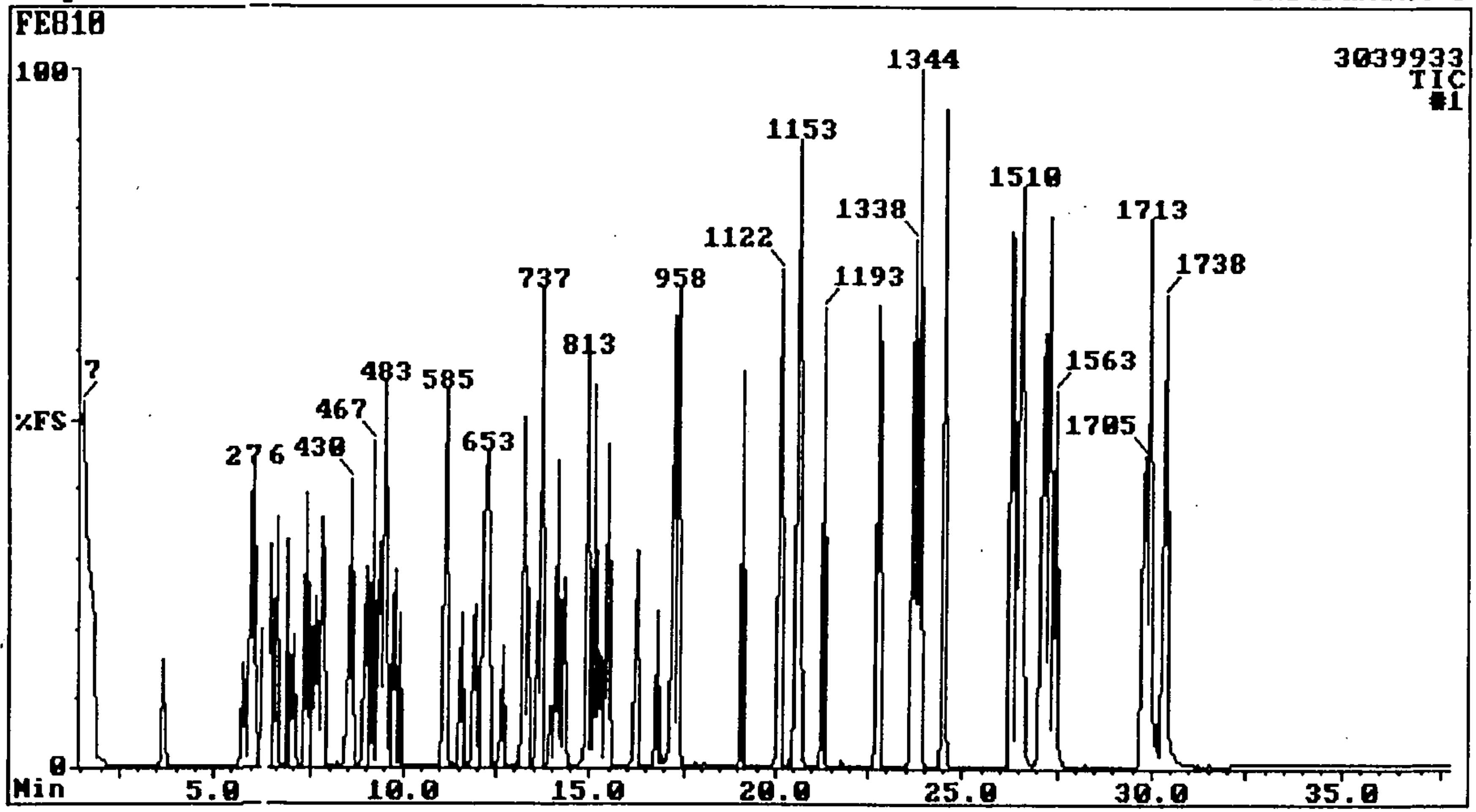


SSTD Ø8Ø

QUAN DB : FE811 LAB-BASE QUAN JMP 19-Sep-91 16:

No.	MAT	FOR	REV	Delta	Area	P.Flags	Scan	QM	Name
1	100	80	98	0	178800	bb	304	152	1,4 Dichlorobenzene-d4
2	100	87	97	0	736790	bb	480	136	Naphthalene-d8
3	100	92	97	1	1375400	bb	483	128	Naphthalene
4	100	93	98	0	897540	vb	584	142	2-Methylnaphthalene
5	100	90	99	0	403140	bb	732	164	Acenaphthene-d10
6	100	95	98	1	776240	bb	653	162	2-Chloronaphthalene
7	100	95	99	0	1245700	bb	710	152	Acenaphthylene
8	100	78	99	1	833790	bb	737	153	Acenaphthene
9	100	93	96	0	789740	bb	812	166	Fluorene
10	100	88	96	0	494980	vv	945	188	Phenanthrene-d10
11	100	94	98	1	999550	vv	949	178	Phenanthrene
12	100	94	97	1	989160	vb*	957	178	Anthracene
13	100	95	97	0	1180400	vv	1121	202	Fluoranthene
14	89	59	94	1	703860	vb	1338	240	Chrysene-d12
15	100	90	98	-1	860060	vb	1192	244	Terphenyl-d14
16	100	93	96	0	1279300	vb	1152	202	Pyrene
17	100	91	97	0	1476500	vv*	1336	228	Benzo(a)anthracene
18	100	94	99	0	1497700	vb	1342	228	Chrysene
19	100	86	93	1	928090	bb	1557	264	Perylene-d12
20	100	92	95	-1	1618300	vv	1502	252	Benzo(b)fluoranthene
21	100	93	96	0	1930300	vb	1508	252	Benzo(k)fluoranthene
22	100	92	99	0	1698000	bv*	1541	252	Benzo(e)pyrene
23	100	92	99	0	1811600	vv	1549	252	Benzo(a)pyrene
24	100	90	98	0	1087200	vv	1561	252	Perylene
25	100	95	97	0	1676800	bv	1702	276	Indeno(1,2,3-cd)pyrene
26	100	90	94	0	1821600	vv	1710	278	Dibenz(a,h)anthracene
27	100	93	95	1	1924800	b? ✓JMP 9-20-91	1735	276	Benzo(g,h,i)perylene
28	100	83	96	0	91592	bb	923	266	Pentachlorophenol
29	100	86	98	1	396740	bb	383	82	Nitrobenzene-d5
30	100	94	99	0	731550	bb	645	172	2-Fluorobiphenyl
31	93	73	87	0	65024	bb	847	330	2,4,6-Tribromophenol
32	100	68	97	1	469840	bb	274	99	Phenol-d5
33	100	83	96	0	870960	vb	1149	212	Pyrene-d10
34	100	87	97	1	882130	vb	954	188	Anthracene-d10
35	100	79	96	0	170790	bb	488	240	1,4-Dibromobenzene-d4
36	98	71	86	0	312430	bb	429	185	1,3,5-Trichlorobenzene-(

19-Sep-91 14:36 Triangle Labs, Inc. (919) 544-5729
Sample: SSTD120 Instrument F



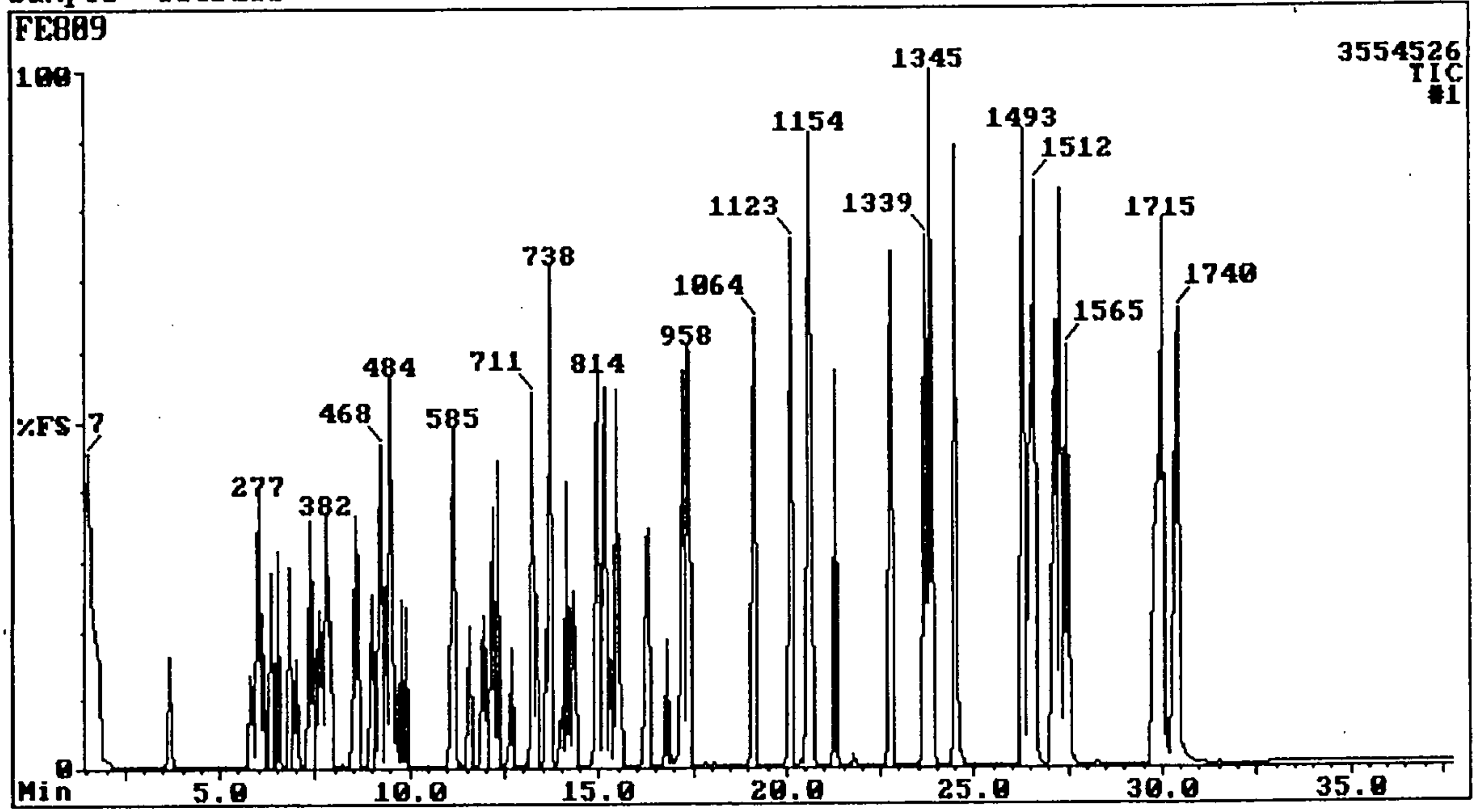
SSTP 120

QUAN DB : FE810 LAB-BASE QUAN 19-Sep-91 15:

No.	MAT	FOR	REV	Delta	Area	P.Flags	Scan	QM	Name
1	100	76	98	0	173200	bb	304	152	1,4 Dichlorobenzene-d4
2	100	79	95	0	709380	bb	480	136	Naphthalene-d8
3	100	93	98	1	2012000	bb	483	128	Naphthalene
4	100	92	98	1	1163000	vb	585	142	2-Methylnaphthalene
5	100	81	99	0	400730	bb	732	164	Acenaphthene-d10
6	100	96	99	1	1161200	bb	653	162	2-Chloronaphthalene
7	100	95	99	0	1940800	bb	710	152	Acenaphthylene
8	100	81	99	1	1290100	bb	737	153	Acenaphthene
9	100	93	96	1	1255700	bb	813	166	Fluorene
10	100	81	96	1	688540	bv	946	188	Phenanthrene-d10
11	100	93	98	1	1954400	bv	950	178	Phenanthrene
12	100	94	98	1	1834000	vb	958	178	Anthracene
13	100	95	97	0	2106400	vv	1122	202	Fluoranthene
14	82	49	93	1	778130	bb	1339	240	Chrysene-d12
15	100	89	97	-1	1514900	bb	1193	244	Terphenyl-d14
16	100	93	97	0	2160000	vb	1153	202	Pyrene
17	100	92	97	1	2521200	vv*	1338	228	Benzo(a)anthracene
18	100	91	99	1	2433500	vb	1344	228	Chrysene
19	100	84	93	1	1034500	vb	1558	264	Perylene-d12
20	100	92	95	0	2842800	v!* 9-19-91	1504	252	Benzo(b)fluoranthene
21	100	93	96	1	3050000	vb	1510	252	Benzo(k)fluoranthene
22	100	92	99	2	2895400	vv	1544	252	Benzo(e)pyrene
23	100	92	99	2	3099200	vv	1552	252	Benzo(a)pyrene
24	100	91	98	1	1769500	vv	1563	252	Perylene
25	100	95	97	1	2912800	bv	1704	276	Indeno(1,2,3-cd)pyrene
26	99	90	94	2	3308000	bv	1713	278	Dibenz(a,h)anthracene
27	93	93	95	3	3352800	b? 9-19-91	1738	276	Benzo(g,h,i)perylene
28	100	83	97	0	167490	bb	924	266	Pentachlorophenol
29	93	75	98	2	601100	bb	384	82	Nitrobenzene-d5
30	100	93	98	1	1091000	bb	646	172	2-Fluorobiphenyl
31	90	71	84	1	112140	bb	848	330	2,4,6-Tribromophenol
32	88	58	94	2	694570	bb	275	99	Phenol-d5
33	100	77	97	0	1580200	vb	1150	212	Pyrene-d10
34	100	82	97	1	1545900	vb	955	188	Anthracene-d10
35	100	80	97	0	247940	bb	488	240	1,4-Dibromobenzene-d4
36	87	63	87	1	452300	bb	430	185	1,3,5-Trichlorobenzene-

19-Sep-91 13:53 Triangle Labs, Inc. (919) 544-5729

Sample: SSTD160 Instrument F



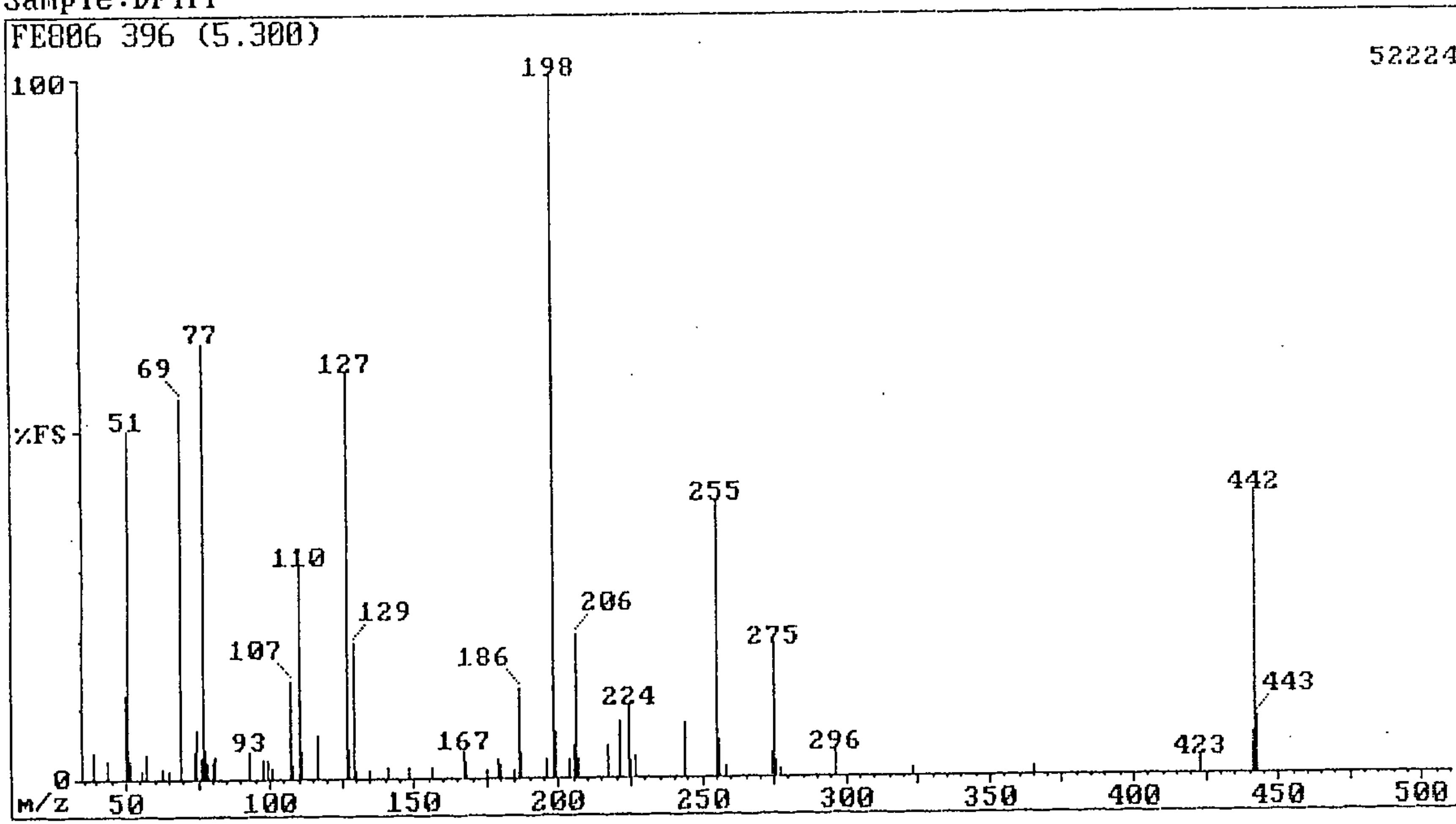
SSTD 160 3-7

QUAN DB : FE809 LAB-BASE QUAN 19-Sep-91 14:4

No.	MAT	FOR	REV	Delta	Area	P.Flags	Scan	QM	Name
1	100	76	98	1	138860	bb	305	152	1,4 Dichlorobenzene-d4
2	91	76	94	-1	589570	bb	481	136	Naphthalene-d8
3	100	93	97	1	2203200	bb	484	128	Naphthalene
4	100	92	98	0	1811900	bb	585	142	2-Methylnaphthalene
5	100	70	97	0	343650	bb	733	164	Acenaphthene-d10
6	100	95	98	1	1301800	bb	654	162	2-Chloronaphthalene
7	100	95	99	0	2149200	bb	711	152	Acenaphthylene
8	100	81	99	1	1431700	bb	738	153	Acenaphthene
9	100	91	95	1	1499500	bb	814	166	Fluorene
10	100	77	96	0	675180	vv	946	188	Phenanthrene-d10
11	100	94	98	1	2415300	bv	950	178	Phenanthrene
12	100	94	98	1	2263600	vb	958	178	Anthracene
13	100	94	97	1	2646400	vv	1123	202	Fluoranthene
14	77	51	93	2	769280	bb	1340	240	Chrysene-d12
15	100	90	98	-2	1853800	bb	1193	244	Terphenyl-d14
16	100	88	97	0	2745400	bb	1154	202	Pyrene
17	100	87	97	1	3229200	bv*	1339	228	Benzo(a)anthracene
18	100	89	100	1	2975900	vb	1345	228	Chrysene
19	93	81	92	2	1026200	vb	1560	264	Perylene-d12
20	100	92	95	1	3969500	v!* ✓ JAS	1507	252	Benzo(b)fluoranthene
21	100	93	96	1	3693000	!b ✓ 9-19-91	1512	252	Benzo(k)fluoranthene
22	100	92	99	1	3782700	vv	1545	252	Benzo(e)pyrene
23	100	92	99	2	3818300	vv	1554	252	Benzo(a)pyrene
24	100	91	98	1	2255800	vv	1565	252	Perylene
25	100	93	97	2	3864800	bv	1708	276	Indeno(1,2,3-cd)pyrene
26	100	89	94	1	4173800	bv	1715	278	Dibenz(a,h)anthracene
27	100	93	95	2	4082100	b? ✓ JAS 9-17-91	1740	276	Benzo(g,h,i)perylene
28	100	84	97	0	196480	bb	924	266	Pentachlorophenol
29	89	68	98	2	660900	bb	385	82	Nitrobenzene-d5
30	100	93	99	0	1178900	bb	646	172	2-Fluorobiphenyl
31	92	73	86	1	129500	bb	849	330	2,4,6-Tribromophenol
32	85	54	92	1	778800	bb	275	99	Phenol-d5
33	100	77	97	0	1996800	vb	1151	212	Pyrene-d10
34	100	82	98	2	1982900	vb	956	188	Anthracene-d10
35	100	81	95	-1	270030	bb	489	240	1,4-Dibromobenzene-d4
36	92	61	86	0	479280	bb	430	185	1,3,5-Trichlorobenzene-(

19-Sep-91 12:08 Triangle Labs, Inc. (919) 544-5729

Sample:DFTPP Instrument F



FEB06 396 (5.300)

Pk#	Mass	Abs Int	Rel Int	Pk#	Mass	Abs Int	Rel Int	Pk#	Mass	Abs Int	Rel Int	Pk#	Mass	Abs Int	Rel Int	Pk#	Mass	Abs Int	Rel Int
1	39	2064	3.95	15	78	2304	4.41	29	128	2208	4.23	43	187	1728	3.31	57	255	20480	39.22
2	44	1392	2.67	16	79	1312	2.51	30	129	10112	19.36	44	196	1392	2.67	58	256	2864	5.48
3	50	6272	12.01	17	80	1120	2.14	31	130	640	1.23	45	198	52224	100.00	59	258	736	1.41
4	51	26112	50.00	18	81	1648	3.16	32	135	628	1.20	46	199	3488	6.68	60	274	1760	3.37
5	52	1360	2.60	19	93	1952	3.74	33	141	892	1.71	47	204	1392	2.67	61	275	9792	18.75
6	56	596	1.14	20	98	1392	2.67	34	148	840	1.61	48	205	2400	4.60	62	276	1216	2.33
7	57	1808	3.46	21	99	1440	2.76	35	156	848	1.62	49	206	10688	20.47	63	277	560	1.07
8	63	864	1.65	22	101	820	1.57	36	167	2032	3.89	50	207	1344	2.57	64	296	1792	3.43
9	65	516	0.99	23	107	7296	13.97	37	168	1216	2.33	51	217	2384	4.56	65	323	668	1.28
10	69	28416	54.41	24	108	1056	2.02	38	175	696	1.33	52	221	4288	8.21	66	365	696	1.33
11	74	2000	3.83	25	110	15936	30.51	39	179	1360	2.60	53	224	5312	10.17	67	423	1232	2.36
12	75	3600	6.89	26	111	1952	3.74	40	180	960	1.84	54	225	1264	2.42	68	441	3024	5.79
13	76	1632	3.13	27	117	3248	6.22	41	185	584	1.12	55	227	1696	3.25	69	442	20992	40.20
14	77	32512	62.25	28	127	30208	57.84	42	186	6720	12.87	56	244	4016	7.69	70	443	4288	8.21

DFTPP TUNE CHECK REPORT

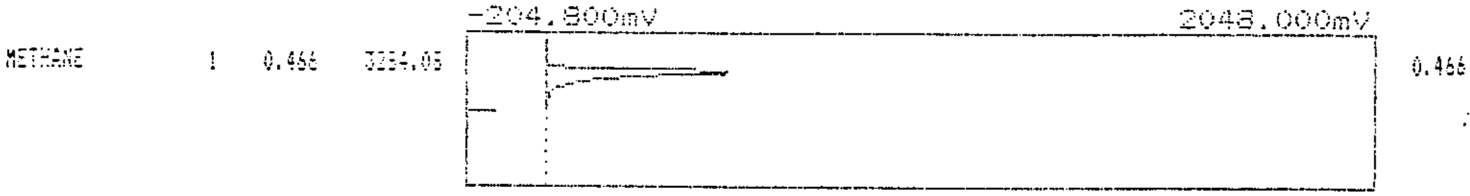
Raw Data File: FE806
Date: 19-Sep-91
Time: 12:08

M/E	ION ABUNDANCE CRITERIA	RELATIVE ABUNDANCE		TUNE
51	30.0 - 60.0% of mass 198	50.00		PASS
68	Less than 2.0% of mass 69	0.00(	0.0)1	PASS
69	Mass 69 relative abundance	54.41		PASS
70	Less then 2.0% of mass 69	0.00(	0.0)1	PASS
127	40.0 - 60.0% of mass 198	57.84		PASS
197	Less than 1% of mass 198	0.00		PASS
198	Base peak, 100% relative abundance	100.00		PASS
199	5 - 9% of mass 198	6.68		PASS
275	10 - 30% of mass 198	18.75		PASS
365	Greater than 1% of mass 198	1.33		PASS
441	Present, but less then mass 443	5.79		PASS
442	Greater than 40% of mass 198	40.20		PASS
443	17 - 23% of mass 442	8.21(	20.4)2	PASS

IX. CALIBRATIONS

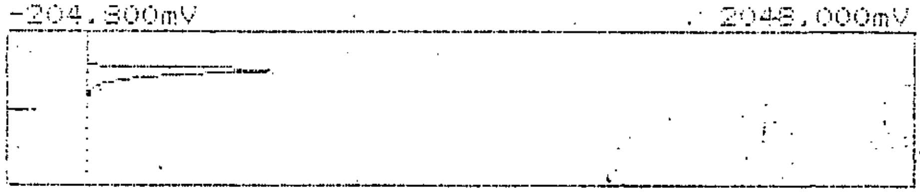
B. GAS CHROMATOGRAPHY

Operator : RAMCON
Instrument : Instrument 1
File : LRMET3A.CHR
Temperature : BTEX.TEM
Components : BTEX.CPT



Component	Number	Retention	Height	Area	Area %	External	Units
METHANE	1	0.466	499.818	3284.08	100.00	N/A	
1				3284.08	100.00	N/A	

Operator : RAMCON
Instrument : Instrument 1
File : LRMET3B.CHR
Temperature : BTEX.TEM
Components : BTEX.CPT



Component	Number	Retention	Height	Area	Area %	External	Unit.
METHANE	1	0.466	503.804	3334.72	100.00	N/A	
1				3334.72	100.00	N/A	

PREPARATION OF STANDARDS IN TEDLAR BAGS AND CALIBRATION CURVE

STANDARDS

Standards Preparation Data:	Mixture #1	Mixture #2	Mixture #3
Organic: BTEX	Benzene	Toluene	Ethyl Benzene
Bag # or identification			
Dry gas meter calibration factor	.99	.99	.99
Final meter reading (liters)	50	50	50
Initial meter reading (liters)	0	0	0
Metered volume (liters)	50	50	50
Avg. meter temperature (°K)	299.64	299.64	299.64
Avg. meter pressure, gauge (mm Hg)	26.02	26.02	26.02
Avg. atmospheric pressure (mm Hg)	762.26	762.26	762.26
Avg. meter pressure, absolute (mm Hg)	788.28	788.28	788.28
Syringe temperature (°K)			
Syringe pressure, absolute (mm Hg)			
Volume of gas in syringe (ml)			
Density of liquid organic (g/ml)	.874	.865	.867
Volume of liquid in syringe (µl)	2.3	2	2.5

GC Operating Conditions:			
Sample loop volume (ml)	1	1	1
Sample loop temperature (°C)	75	75	75
Carrier gas flow rate (ml/min)	30	30	30
Column temperature:			
Initial (°C)	75	75	75
Rate change (°C/min)	-	-	-
Final (°C)	75	75	75

Organic Peak Identification and Calculated Concentrations:			
Injection time (24-hr clock)			
Distance to peak (cm)	1.55	2.94	5.38
Chart speed (cm/min)			
Organic retention time (min)	1.55	2.94	5.38
Attenuation factor	16	16	16
Peak height (mm)	17.537	11.840	7.932
Peak area (mm^2)	160.56	158.60	157.25
Peak area x attenuation factor (mm^2)	2568.96	2537.6	2516
Calculated concentration (ppm) (Equation 18-3 or 18-4)	12.3	9.4	9.78

Plot peak area x attenuation factor against calculated concentration to obtain calib curve.

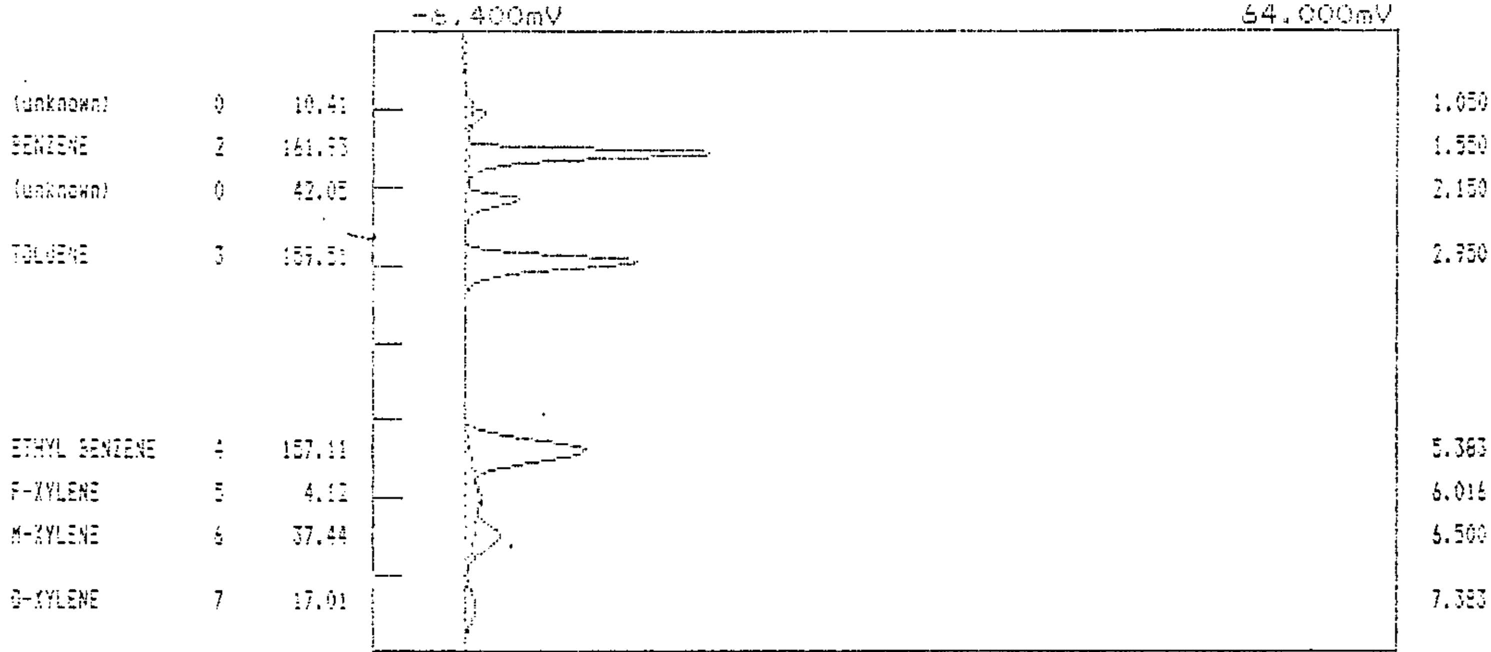
PREPARATION OF STANDARDS IN TEDLAR BAGS AND CALIBRATION CU

STANDARDS

Standards Preparation Data:	Mixture #1	Mixture #2	Mixtur #3
Organic:	Xylene	[illegible]	[illegible]
Bag # or identification			
Dry gas meter calibration factor	1.99		
Final meter reading (liters)	50		
Initial meter reading (liters)	0		
Metered volume (liters)	50		
Avg. meter temperature (°K)	299.64		
Avg. meter pressure, gauge (mm Hg)	26.02		
Avg. atmospheric pressure (mm Hg)	762.26		
Avg. meter pressure, absolute (mm Hg)	788.25		
Syringe temperature (°K)			
Syringe pressure, absolute (mm Hg)			
Volume of gas in syringe (ml)			
Density of liquid organic (g/ml)	.860		
Volume of liquid in syringe (μ l)	1.8		
GC Operating Conditions:			
Sample loop volume (ml)	1		
Sample loop temperature (°C)	75		
Carrier gas flow rate (ml/min)	30		
Column temperature:			
Initial (°C)	75		
Rate change (°C/min)	0		
Final (°C)	75		
Organic Peak Identification and Calculated Concentrations:			
Injection time (24-hr clock)			
Distance to peak (cm)	6.0/6.5/7.3		
Chart speed (cm/min)			
Organic retention time (min)	6.0/6.5/7.3		
Attenuation factor	16		
Peak height (mm)	6.0/6.5/7.3		
Peak area (mm^2)	57.01		
Peak area x attenuation factor (mm^2)	912.16		
Calculated concentration (ppm) (Equation 18-3 or 18-4)	3.1		

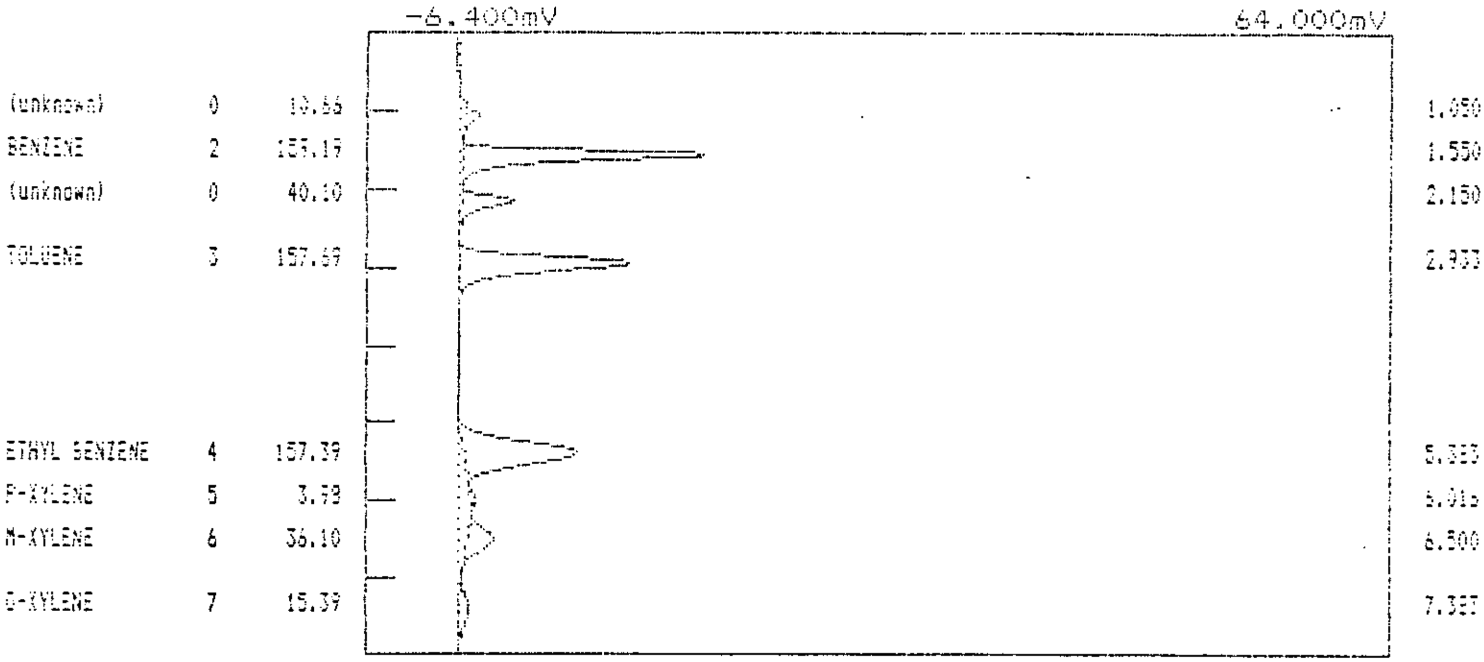
Plot peak area x attenuation factor against calculated concentration to obtain c curve.

Operator : RAMCON
Instrument : Instrument 1
File : CAL10A.CHR
Temperature : BTEX.TEM
Components : BTEX.CPT



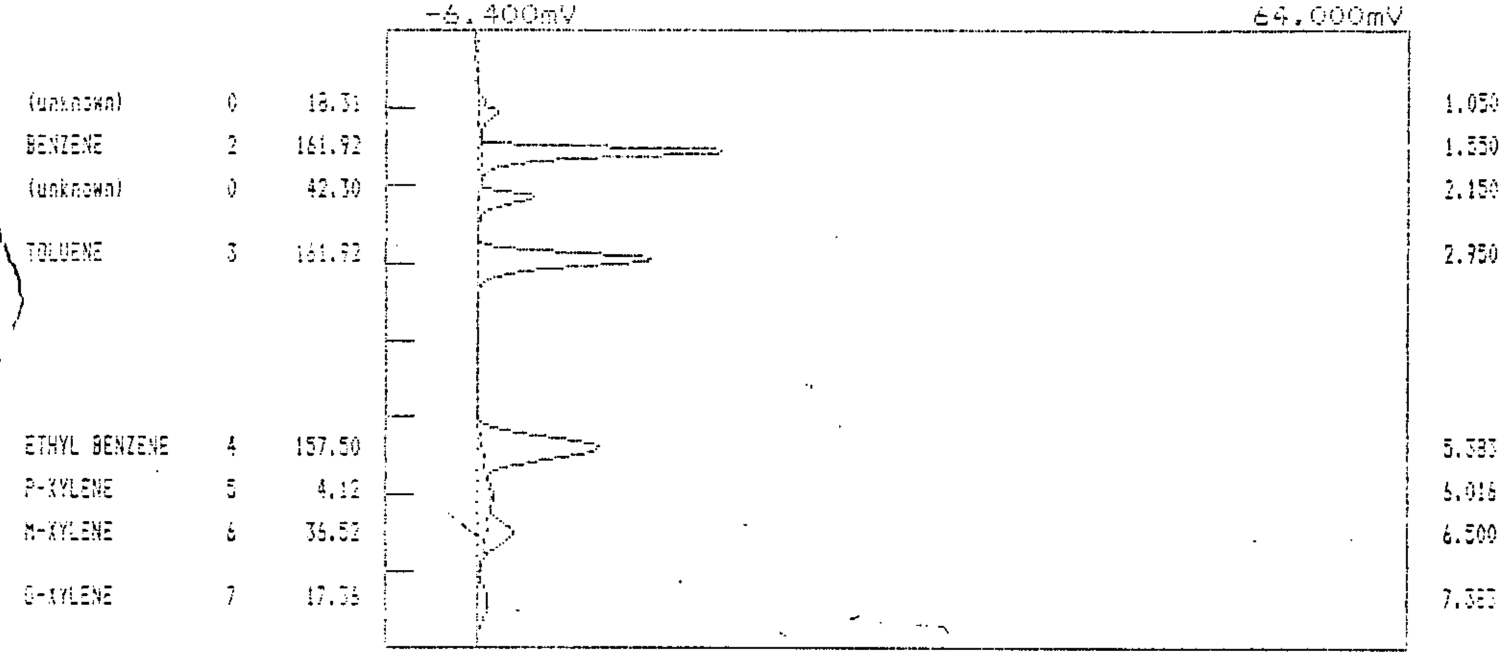
Component	Number	Retention	Height	Area	Area %	External	Unit
BENZENE	2	1.550	17.626	161.93	27.47	N/A	
TOLUENE	3	2.950	11.920	159.51	27.05	N/A	
ETHYL BENZENE	4	5.383	7.965	157.11	26.65	N/A	
P-XYLENE	5	6.016	0.346	4.12	0.70	N/A	
M-XYLENE	6	6.500	1.795	37.44	6.35	N/A	
O-XYLENE	7	7.383	0.680	17.01	2.89	N/A	
6				537.12	100.00	N/A	

Operator : RAMCON
Instrument : Instrument 1
File : CAL10B.CHR
Temperature : BTEX.TEM
Components : BTEX.CPT



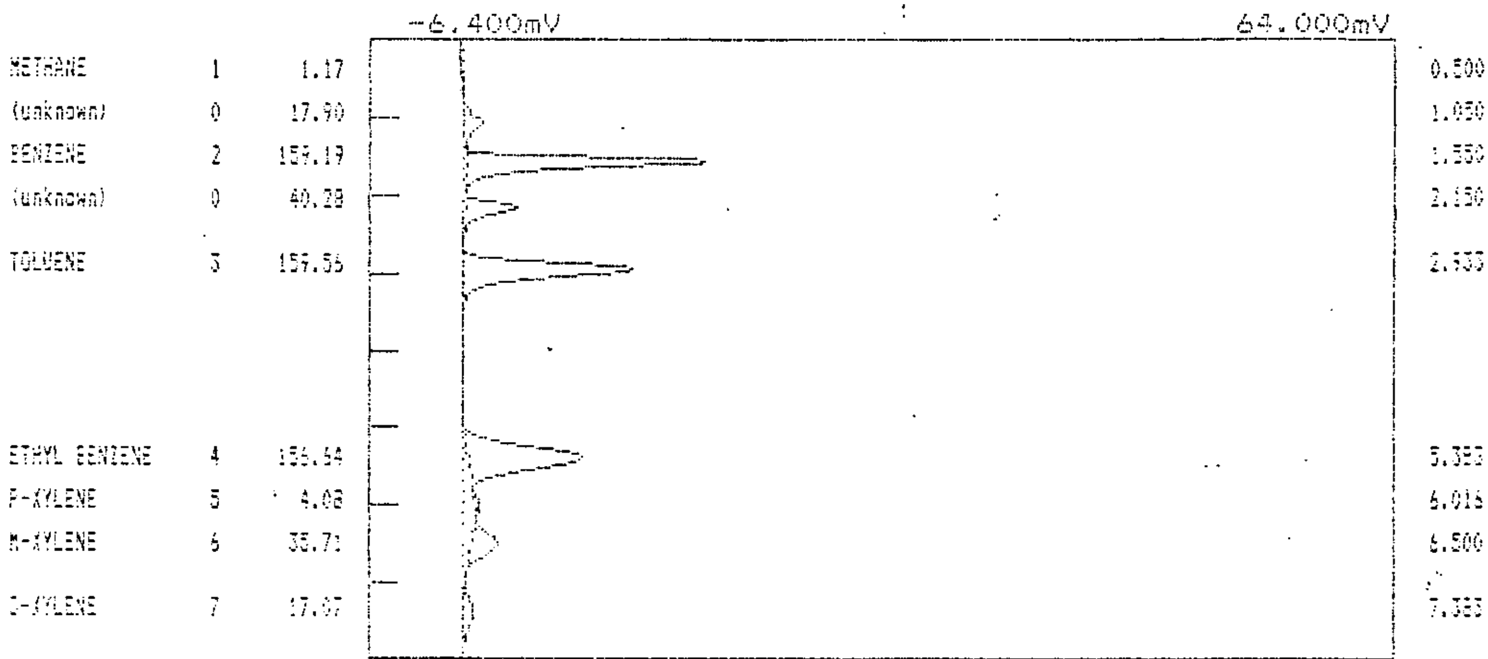
Component	Number	Retention	Height	Area	Area %	External	Units
BENZENE	2	1.550	17.448	159.19	27.42	N/A	
TOLUENE	3	2.933	11.761	157.69	27.16	N/A	
ETHYL BENZENE	4	5.383	7.599	157.39	27.11	N/A	
P-XYLENE	5	6.016	0.337	3.78	0.69	N/A	
M-XYLENE	6	6.500	1.773	36.10	6.22	N/A	
O-XYLENE	7	7.383	0.655	15.39	2.68	N/A	
6				529.74	100.00	N/A	

Operator : RAMCON
Instrument : Instrument 1
File : KCAL10A.CHR
Temperature : BTEX.TEM
Components : BTEX.CPT



Component	Number	Retention	Height	Area	Area %	External	Units
BENZENE	2	1.550	17.626	161.92	26.99	N/A	
TOLUENE	3	2.950	11.942	161.92	26.77	N/A	
ETHYL BENZENE	4	5.383	7.473	157.50	26.25	N/A	
P-XYLENE	5	6.016	0.346	4.12	0.69	N/A	
M-XYLENE	6	6.500	1.781	36.52	6.09	N/A	
O-XYLENE	7	7.383	0.685	17.36	2.89	N/A	
6				539.34	100.00	N/A	

Operator : RAMCON
Instrument : Instrument 1
File : KCAL10B.CHR
Temperature : BTEX.TEM
Components : BTEX.CPT



Component	Number	Retention	Height	Area	Area %	External	Units
METHANE	1	0.500	0.133	1.17	0.22	N/A	
BENZENE	2	1.550	17.448	159.19	29.91	N/A	
TOLUENE	3	2.933	11.778	157.56	29.57	N/A	
ETHYL BENZENE	4	5.383	7.888	156.64	29.45	N/A	
P-XYLENE	5	6.016	0.342	4.08	0.69	N/A	
M-XYLENE	6	6.500	1.767	35.71	6.04	N/A	
O-XYLENE	7	7.383	0.882	17.07	2.69	N/A	
7				533.42	100.00	N/A	

PREPARATION OF STANDARDS IN TEDLAR BAGS AND CALIBRATION CURVE

	STANDARDS		
Standards Preparation Data:	Mixture #1	Mixture #2	Mixture #3
Organic: BTEX	Benzene	Toluene	Ethyl Benzene
Bag # or identification			
Dry gas meter calibration factor	.99	.99	.99
Final meter reading (liters)	50	50	50
Initial meter reading (liters)	0	0	0
Metered volume (liters)	50	50	50
Avg. meter temperature (°K)	299.64	299.64	299.64
Avg. meter pressure, gauge (mm Hg)	26.02	26.02	26.02
Avg. atmospheric pressure (mm Hg)	762.26	762.26	762.26
Avg. meter pressure, absolute (mm Hg)	788.28	788.28	788.28
Syringe temperature (°K)			
Syringe pressure, absolute (mm Hg)			
Volume of gas in syringe (ml)			
Density of liquid organic (g/ml)	.874	.865	.867
Volume of liquid in syringe (μl)	6.5	6	10.5
GC Operating Conditions:			
Sample loop volume (ml)	1	1	1
Sample loop temperature (°C)	75	75	75
Carrier gas flow rate (ml/min)	30	30	30
Column temperature:			
Initial (°C)	75	75	75
Rate change (°C/min)	–	–	–
Final (°C)	75	75	75
Organic Peak Identification and Calculated Concentrations:			
Injection time (24-hr clock)			
Distance to peak (cm)	1.5	2.9	6.4
Chart speed (cm/min)			
Organic retention time (min)	1.5	2.9	6.4
Attenuation factor	16	16	16
Peak height (mm)	48.9	36.4	11.25
Peak area (mm^2)	444.8	483.60	648.57
Peak area x attenuation factor (mm^2)	7116.8	7737.6	10377.12
Calculated concentration (ppm) (Equation 18-3 or 18-4)	34.8	26.9	41

Plot peak area x attenuation factor against calculated concentration to obtain calibrati curve.

PREPARATION OF STANDARDS IN TEDLAR BAGS AND CALIBRATION CURVE

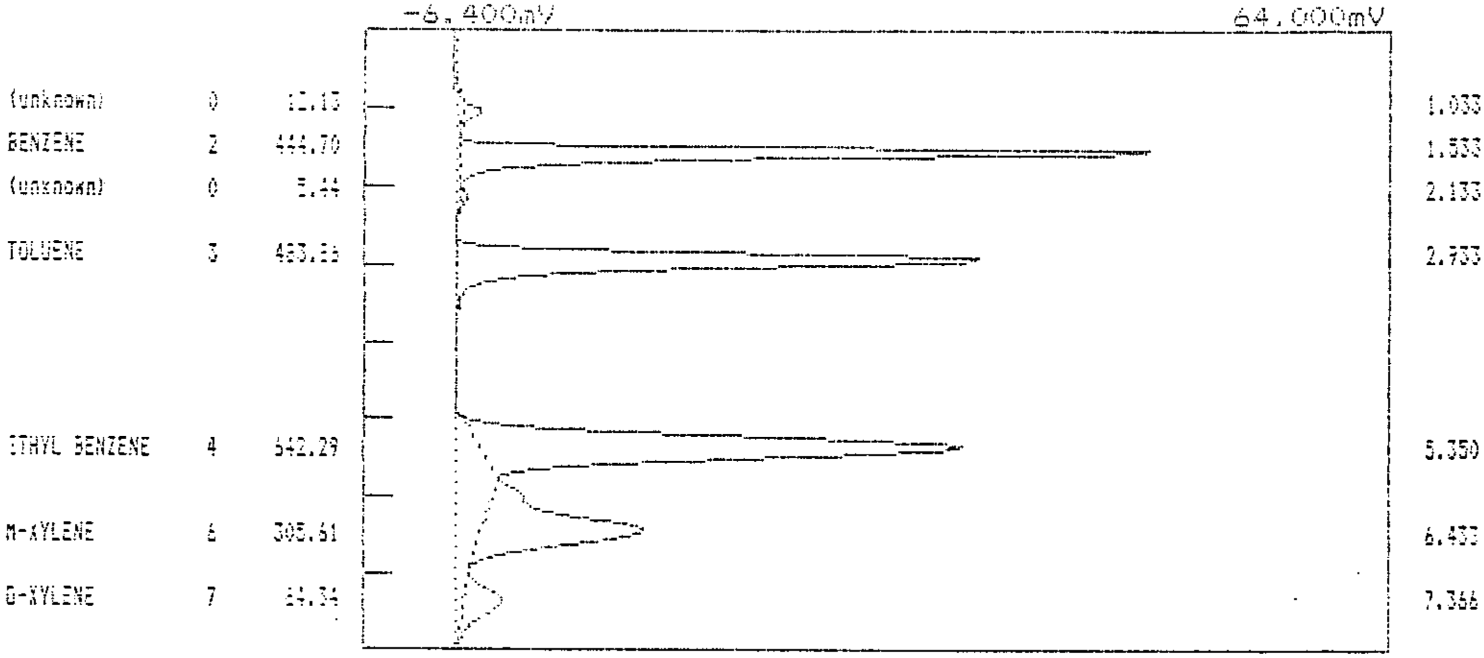
Standards Preparation Data:	STANDARDS Mixture #1	Mixture #2	Mixture #3
Organic:	Xylene		
Bag # or identification			
Dry gas meter calibration factor	1.99		
Final meter reading (liters)	50		
Initial meter reading (liters)	0		
Metered volume (liters)	50		
Avg. meter temperature (°K)	299.64		
Avg. meter pressure, gauge (mm Hg)	26.02		
Avg. atmospheric pressure (mm Hg)	762.26		
Avg. meter pressure, absolute (mm Hg)	788.28		
Syringe temperature (°K)			
Syringe pressure, absolute (mm Hg)			
Volume of gas in syringe (ml)			
Density of liquid organic (g/ml)	.860		
Volume of liquid in syringe (μl)	5.5		

GC Operating Conditions:	Mixture #1	Mixture #2	Mixture #3
Sample loop volume (ml)	1		
Sample loop temperature (°C)	75		
Carrier gas flow rate (ml/min)	30		
Column temperature:			
Initial (°C)	75		
Rate change (°C/min)	-		
Final (°C)	75		

Organic Peak Identification and Calculated Concentrations:	Mixture #1	Mixture #2	Mixture #3
Injection time (24-hr clock)			
Distance to peak (cm)	6.4/7.3		
Chart speed (cm/min)			
Organic retention time (min)	6.4/7.3		
Attenuation factor	16		
Peak height (mm)	11.3/2.5		
Peak area (mm^2)	372.84		
Peak area x attenuation factor (mm^2)			
Calculated concentration (ppm) (Equation 18-3 or 18-4)	21.3		

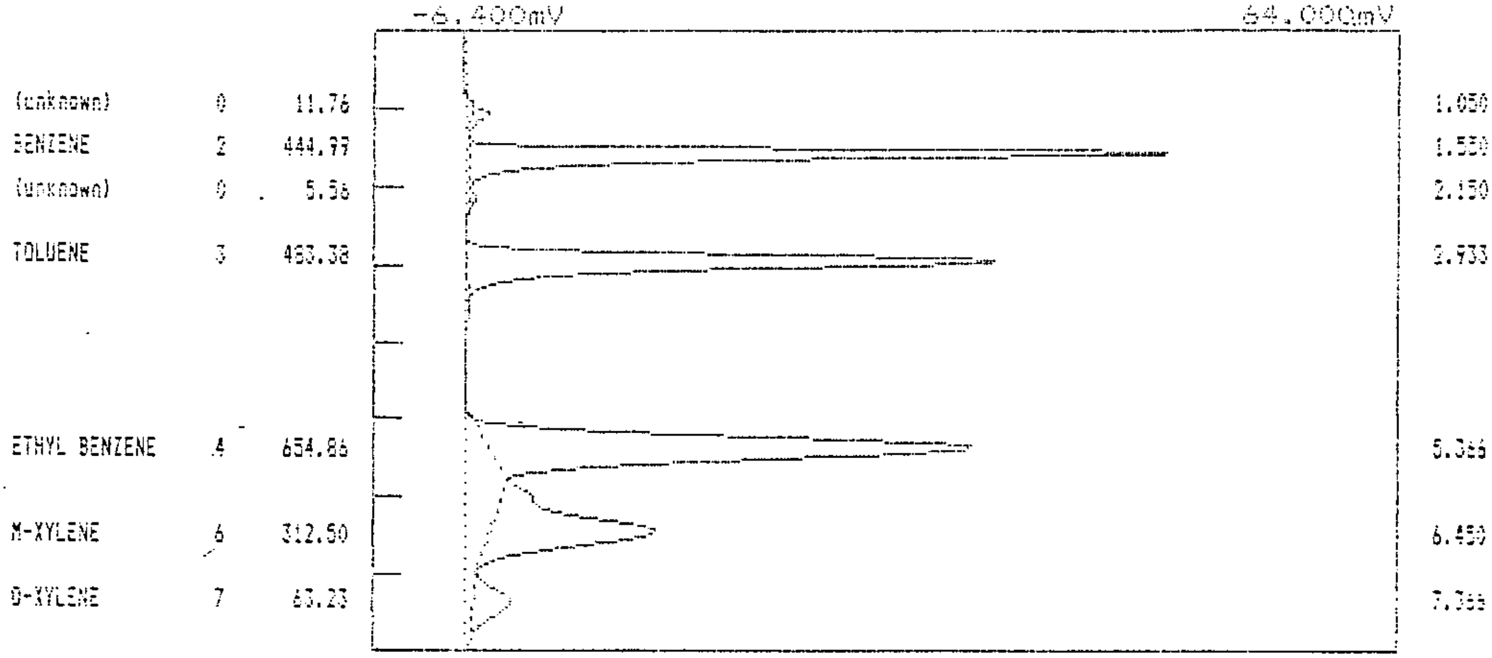
Plot peak area x attenuation factor against calculated concentration to obtain calibrati curve.

Operator : RAMCON
Instrument : Instrument 1
File : CAL50B.CHR
Temperature : BTEX.TEM
Components : BTEX.CPT



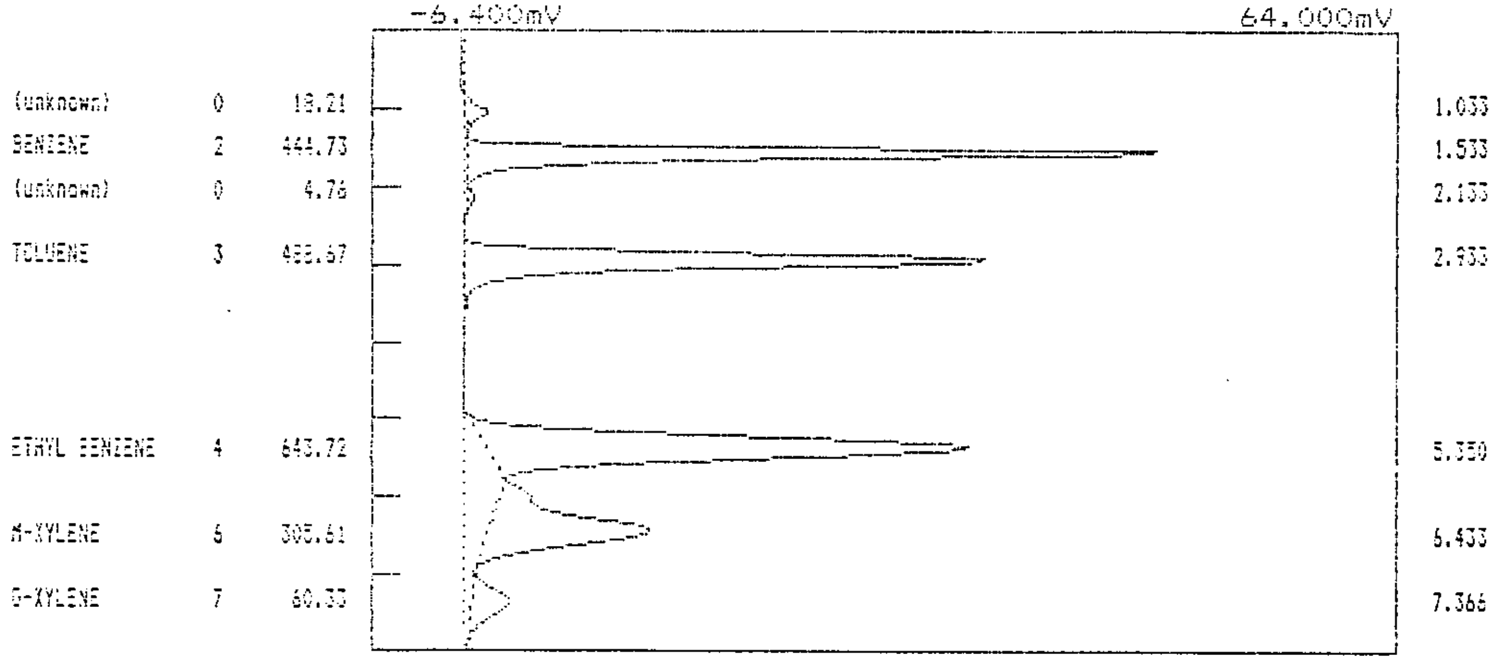
Component	Number	Retention	Height	Area	Area %	External	Units
BENZENE	2	1.533	48.955	444.70	22.71	N/A	
TOLUENE	3	2.933	36.391	483.86	24.71	N/A	
ETHYL BENZENE	4	5.350	33.043	642.29	32.60	N/A	
M-XYLENE	6	6.433	11.207	305.61	15.61	N/A	
O-XYLENE	7	7.366	2.542	64.34	3.29	N/A	
5				1940.80	100.00	N/A	

Operator : RAMCON
Instrument : Instrument 1
File : CAL50C.CHR
Temperature : BTEX.TEM
Components : BTEX.CPT



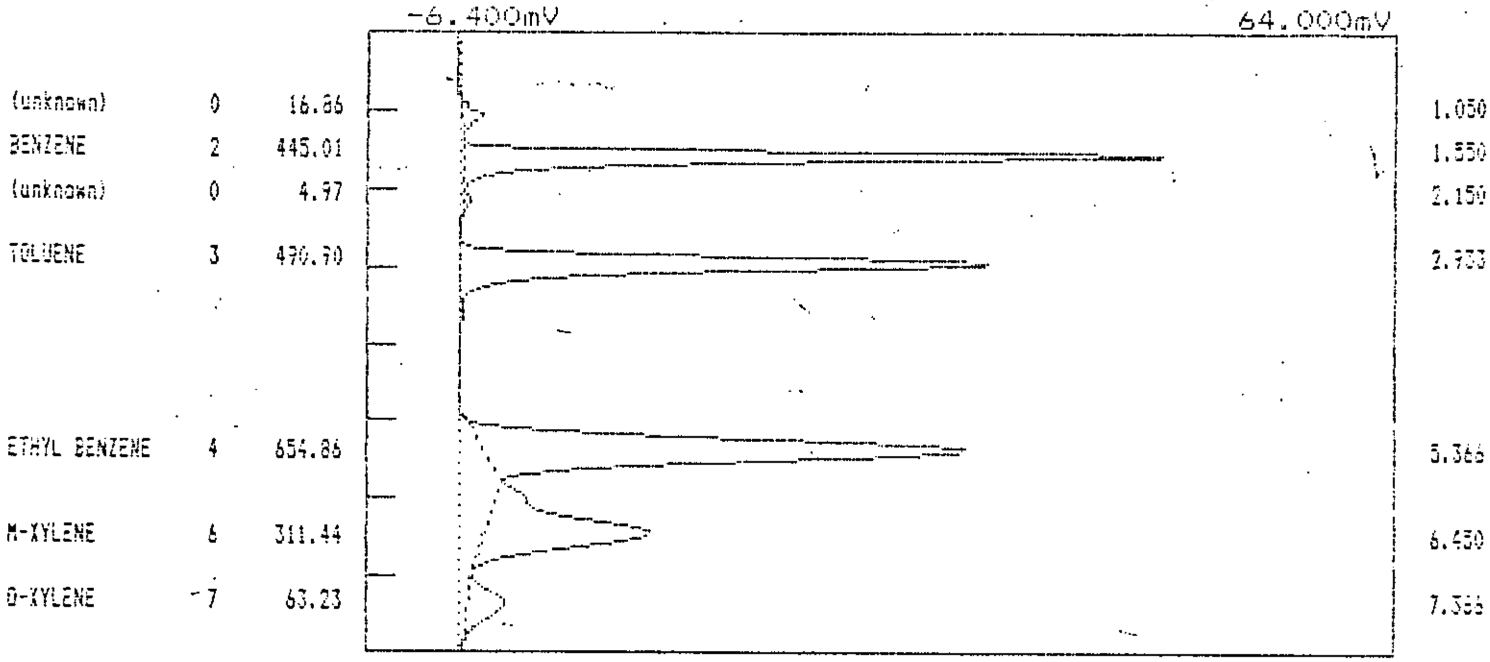
Component	Number	Retention	Height	Area	Area %	External	Unit
BENZENE	2	1.550	49.388	444.99	22.52	N/A	
TOLUENE	3	2.933	36.545	483.38	24.46	N/A	
ETHYL BENZENE	4	5.366	33.301	654.86	33.14	N/A	
M-XYLENE	6	6.450	11.398	312.50	15.81	N/A	
O-XYLENE	7	7.366	2.346	63.23	3.20	N/A	
5				1958.96	100.00	N/A	

Operator : RAMCON
Instrument : Instrument 1
File : KCAL50B.CHR
Temperature : BTEX.TEM
Components : BTEX.CPT



Component	Number	Retention	Height	Area	Area %	External	Units
BENZENE	2	1.533	48.956	444.73	22.62	N/A	
TOLUENE	3	2.933	36.424	488.67	24.86	N/A	
ETHYL BENZENE	4	5.350	33.070	643.72	32.74	N/A	
M-XYLENE	6	6.433	11.207	305.61	15.54	N/A	
O-XYLENE	7	7.366	2.515	60.33	3.07	N/A	
5				1943.05	100.00	N/A	

Operator : RAMCON
Instrument : Instrument 1
File : KCAL50C.CHR
Temperature : BTEX.TEM
Components : BTEX.CPT



Component	Number	Retention	Height	Area	Area %	External	Unit.
BENZENE	2	1.550	49.389	445.01	22.39	N/A	
TOLUENE	3	2.933	36.600	490.90	24.70	N/A	
ETHYL BENZENE	4	5.366	33.301	654.86	32.95	N/A	
M-XYLENE	6	6.450	11.382	311.44	15.67	N/A	
O-XYLENE	7	7.366	2.546	63.23	3.18	N/A	
5				1965.45	100.00	N/A	

PREPARATION OF STANDARDS IN TEDLAR BAGS AND CALIBRATION CURVE

Standards Preparation Data:	STANDARDS Mixture #1	Mixture #2	Mixture #3
Organic: BTEX	Benzene	Toluene	E. Benzene
Bag # or identification			
Dry gas meter calibration factor	.99	.99	.99
Final meter reading (liters)	50	50	50
Initial meter reading (liters)	0	0	0
Metered volume (liters)	50	50	50
Avg. meter temperature (^oK)	299.64	299.64	299.64
Avg. meter pressure, gauge (mm Hg)	26.02	26.02	26.02
Avg. atmospheric pressure (mm Hg)	762.26	762.26	762.26
Avg. meter pressure, absolute (mm Hg)	788.28	788.28	788.28
Syringe temperature (^oK)			
Syringe pressure, absolute (mm Hg)			
Volume of gas in syringe (ml)			
Density of liquid organic (g/ml)	.874	.865	.867
Volume of liquid in syringe (μ l)	1	1.5	2
GC Operating Conditions:			
Sample loop volume (ml)	1	1	1
Sample loop temperature (^oC)	75	75	75
Carrier gas flow rate (ml/min)	30	30	30
Column temperature:			
Initial (^oC)	75	75	75
Rate change (^oC/min)	–	–	–
Final (^oC)	75	75	75
Organic Peak Identification and Calculated Concentrations:			
Injection time (24-hr clock)			
Distance to peak (cm)	1.5	2.9	5.3
Chart speed (cm/min)			
Organic retention time (min)	1.5	2.9	5.3
Attenuation factor	16	16	16
Peak height (mm)	10.2	7.2	6.2
Peak area (mm^2)	63.49	95.24	122.58
Peak area x attenuation factor (mm^2)	1015.84	1523.84	1961.28
Calculated concentration (ppm) (Equation 18-3 or 18-4)	5.3	6.7	7.8

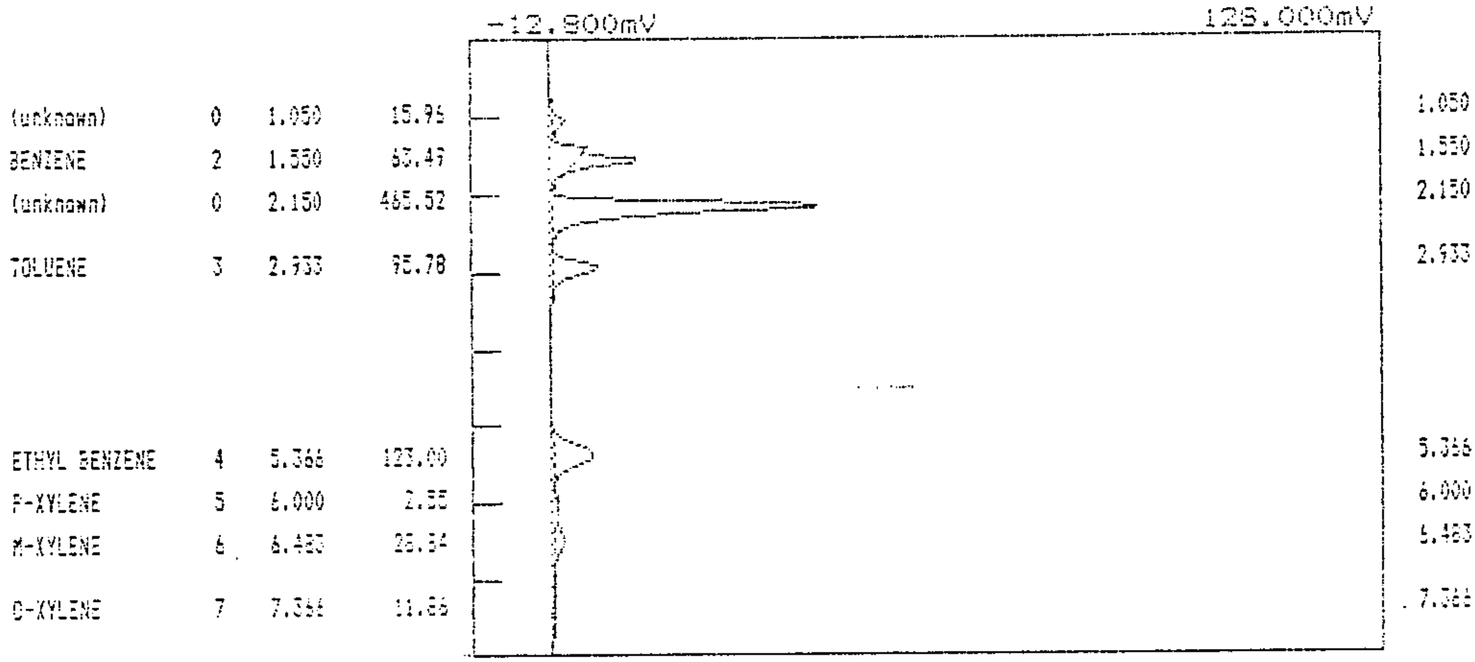
Plot peak area x attenuation factor against calculated concentration to obtain calibration curve.

PREPARATION OF STANDARDS IN TEDLAR BAGS AND CALIBRATION CURVE

	STANDARDS		
Standards Preparation Data:	Mixture #1	Mixture #2	Mixture #3
Organic:	Xylene	[illegible]	[illegible]
Bag # or identification			
Dry gas meter calibration factor	1.99		
Final meter reading (liters)	50		
Initial meter reading (liters)	0		
Metered volume (liters)	50		
Avg. meter temperature (°K)	299.64		
Avg. meter pressure, gauge (mm Hg)	26.02		
Avg. atmospheric pressure (mm Hg)	762.26		
Avg. meter pressure, absolute (mm Hg)	788.28		
Syringe temperature (°K)			
Syringe pressure, absolute (mm Hg)			
Volume of gas in syringe (ml)			
Density of liquid organic (g/ml)	.86		
Volume of liquid in syringe (μ l)	.6		
GC Operating Conditions:			
Sample loop volume (ml)	1		
Sample loop temperature (°C)	75		
Carrier gas flow rate (ml/min)	30		
Column temperature:			
Initial (°C)	75		
Rate change (°C/min)	-		
Final (°C)	75		
Organic Peak Identification and Calculated Concentrations:			
Injection time (24-hr clock)			
Distance to peak (cm)	5.9/6.4/7.3		
Chart speed (cm/min)			
Organic retention time (min)	5.9/6.4/7.3		
Attenuation factor	16		
Peak height (mm)	.2/1.3/.4		
Peak area (mm^2)	42.45		
Peak area x attenuation factor (mm^2)	679.2		
Calculated concentration (ppm) (Equation 18-3 or 18-4)	2.3		

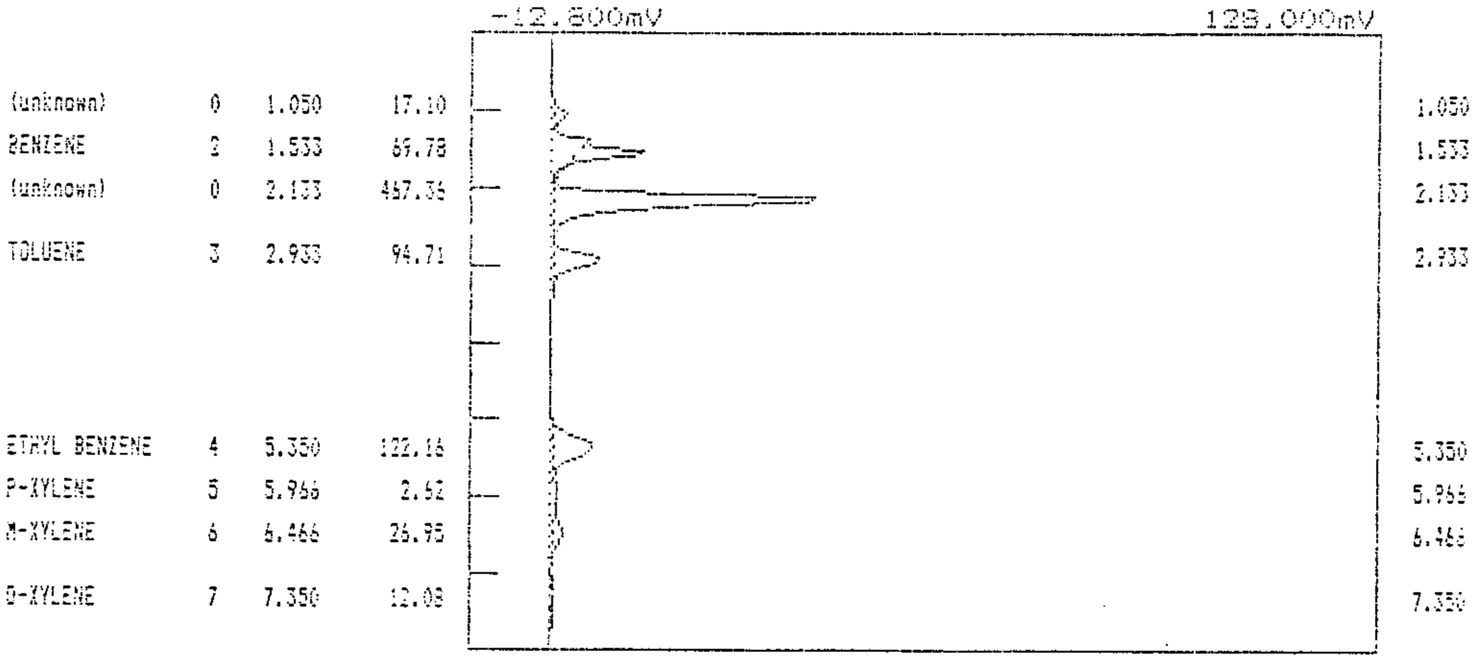
Plot peak area x attenuation factor against calculated concentration to obtain calibration curve.

Operator : RAMCON
Instrument : Instrument 1
File : CAL20A.CHR
Temperature : BTEX.TEM
Components : BTEX.CPT



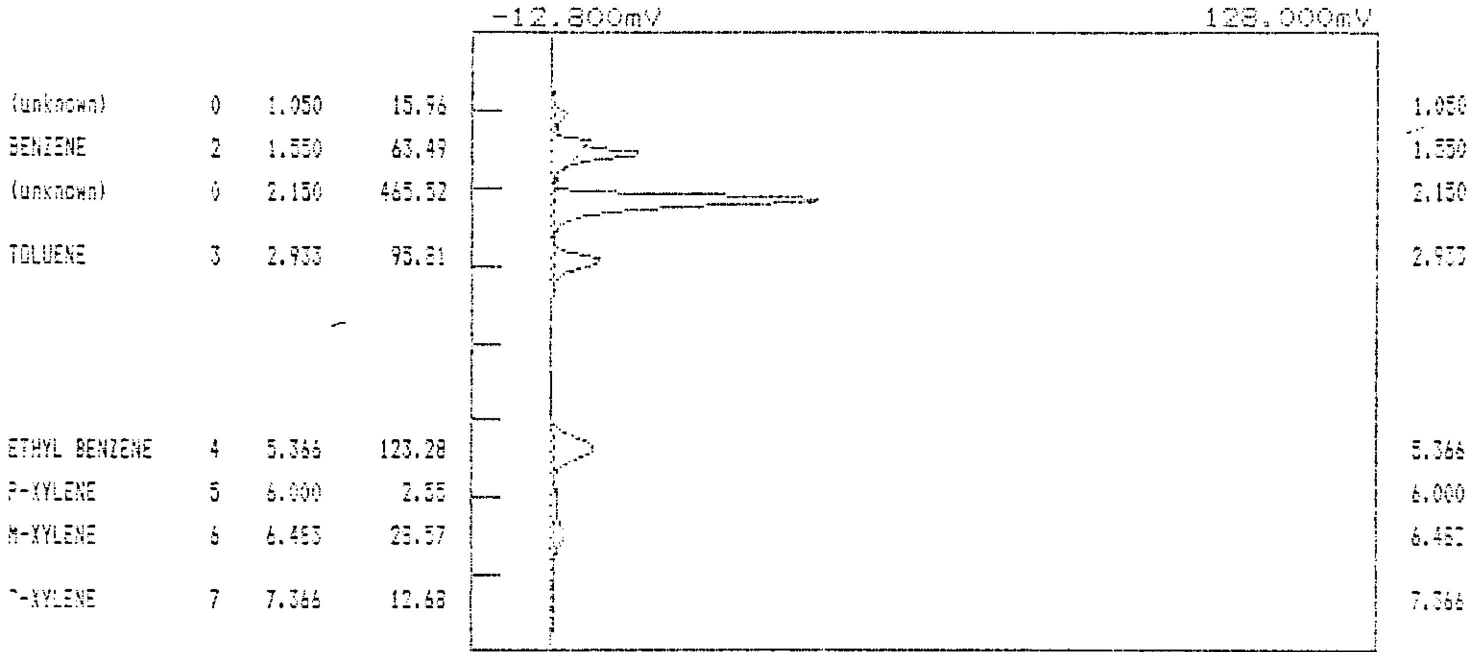
Component	Number	Retention	Height	Area	Area %	External	Units
BENZENE	2	1.550	10.158	63.47	7.80	N/A	
TOLUENE	3	2.933	7.288	95.78	11.77	N/A	
ETHYL BENZENE	4	5.366	6.304	123.00	15.12	N/A	
P-XYLENE	5	6.000	0.223	2.55	0.31	N/A	
M-XYLENE	6	6.483	1.374	28.54	3.54	N/A	
O-XYLENE	7	7.366	0.493	11.86	1.46	N/A	
6				325.51	100.00	N/A	

Operator : RAMCON
Instrument : Instrument 1
File : CAL20B.CHR
Temperature : BTEX.TEM
Components : BTEX.CPT



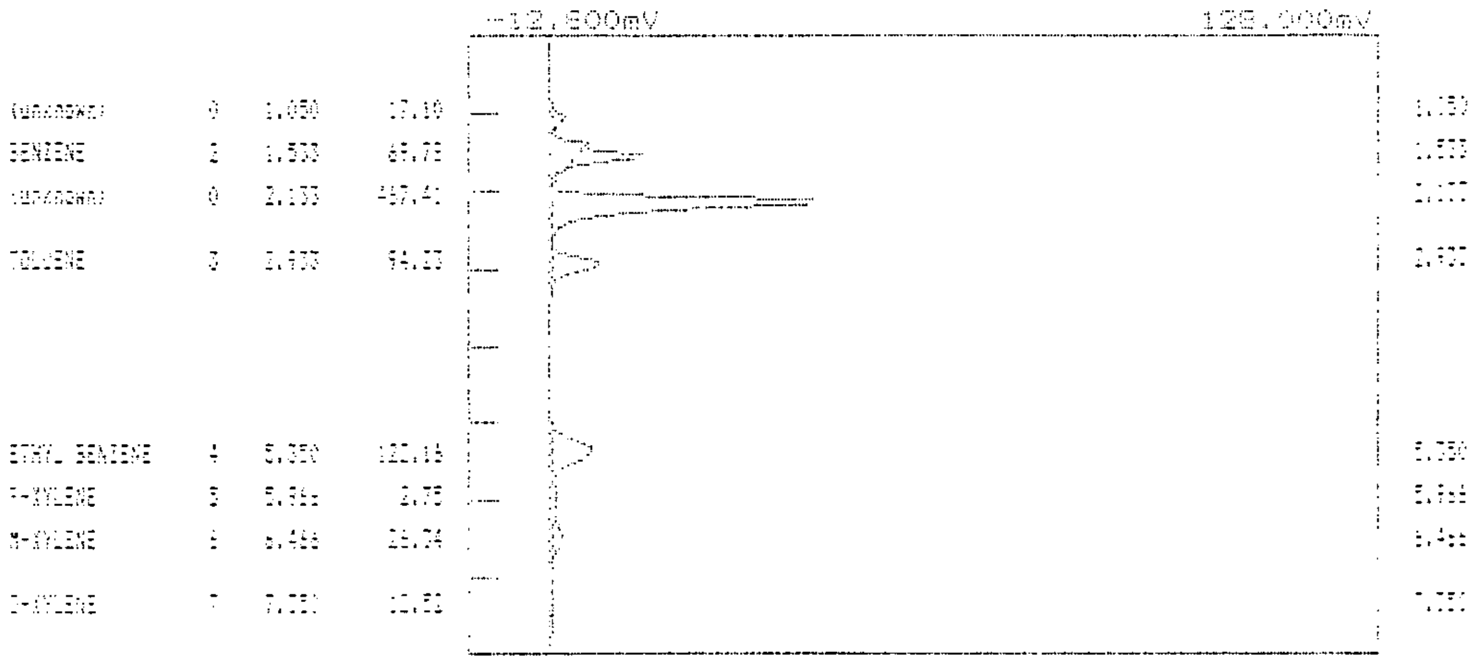
Component	Number	Retention	Height	Area	Area %	External	Units
BENZENE	2	1.533	10.272	69.78	8.53	N/A	
TOLUENE	3	2.933	7.230	94.71	11.58	N/A	
ETHYL BENZENE	4	5.350	6.209	122.16	[illegible]	N/A	
P-XYLENE	5	5.966	0.253	2.62	[illegible]	N/A	
M-XYLENE	6	6.466	1.301	26.95	3.29	N/A	
O-XYLENE	7	7.350	0.490	12.08	1.48	N/A	
6				328.29	100.00	N/A	

Operator : RAMCON
Instrument : Instrument 1
File : KCAL20A.CHR
Temperature : BTEX.TEM
Components : BTEX.CPT



Component	Number	Retention	Height	Area	Area %	External	Units
BENZENE	2	1.550	10.158	63.49	7.79	N/A	
TOLUENE	3	2.933	7.288	95.81	11.76	N/A	
ETHYL BENZENE	4	5.366	6.310	123.28	15.13	N/A	
P-XYLENE	5	6.000	0.221	2.55	0.31	N/A	
M-XYLENE	6	6.483	1.370	28.57	3.51	N/A	
O-XYLENE	7	7.366	0.507	12.68	1.56	N/A	
6				326.38	100.00	N/A	

Operator : RAMCON
Instrument : Instrument 1
File : KCAL20B.CHR
Temperature : BTEX.TEM
Components : BTEX.CPT



Component	Number	Retention	Height	Area	Area %	External	Units
BENZENE	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	N/A	
TOLUENE	[illegible]	[illegible]	7.224	[illegible]	[illegible]	N/A	
ETHYL BENZENE	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	N/A	
P-XYLENE	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	N/A	
M-XYLENE	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	N/A	
O-XYLENE	[illegible]	[illegible]	1.446	[illegible]	[illegible]	N/A	

6				327.78	100.00	N/A

IX. CALIBRATIONS

C. INSTRUMENTAL

INSTRUMENTAL ANALYSIS CALIBRATION DATA

CARBON MONOXIDE

Plant Lehman-Roberts Location Memphis TN

Date 9-3-91 Operator KA

CO Range 1000

Initial Calibration: (Accuracy: ± 5% Span)

Gas Type	Actual Concentration	Anayzer Response
CO-Zero	0	.7
CO-High	981	976.5
CO-Mid	598	612.5
CO-Low	328	314.5

Zero & Span Drift: (Accuracy ± 5% Span)

End Run # 1 Time: 11:25-12:25

Gas Type	Initial Response	Final Response	Drift
CO-Zero	.7	-.5	
CO-	612.5	610.5	

End Run # 2 Time: 14:25-15:25

Gas Type	Initial Response	Final Response	Drift
CO-Zero	-.5	-.3	
CO-	610.5	616.7	

End Run # 3 Time: 16:33-17:33

Gas Type	Initial Response	Final Response	Drift
CO-Zero	-.3	-.6	
CO-	616.7	611.4	

End Run # Time:

Gas Type	Initial Response	Final Response	Drift
CO-Zero			
CO-			

INSTRUMENTAL ANALYSIS CALIBRATION DATA

DILUENT O_2 AND CO_2 MONITORS

Plant Lehman - Roberts Location Memphis Tn

Date 9-3-91 Operator KA

Initial Calibration (Accuracy: ± 2% Span)

O_2 Gas Type	Actual Concentration	Analyzer Response	CO_2 Gas Type	Actual Concentration	Analyzer Response
O_2-Zero	0.0	0.0	CO_2-Zero	0.0	0.1
O_2-High	20.9	20.9	CO_2-High	17.6	18.2
O_2-Mid	10.2	10.2	CO_2-Mid	10.5	10.2

System Bias Reponse: Analyzer Response-Initial Bias = ± 5% Span
Final Bias - Initial Bias = ± 3% Span

Run # 1 Time: 11:25 - 12:25

Gas Type	Initial Bias Response	Final Bias Response	Drift
Zero	0.1 0.0	0.1 0.0	
CO_2/O_2	10.2 10.2	10.0 10.0	

Run # 2 Time: 14:25 - 15:25

Gas Type	Initial Bias Response	Final Bias Response	Drift
Zero	0.1 0.0	0.1 0.0	
CO_2/O_2	10.0 10.0	10.1 10.0	

Run # 3 Time: 16:33 - 17:33

Gas Type	Initial Bias Response	Final Bias Response	Drift
Zero	0.1 0.0	0.0 -.1	
CO_2/O_2	10.1 10.0	10.1 10.0	

Run # Time:

Gas Type	Initial Bias Response	Final Bias Response	Drift
Zero			
CO_2/O_2			

INSTRUMENTAL ANALYSIS CALIBRATION DATA

TOTAL HYDROCARBONS

PLANT Lehman-Roberts LOCATION Memphis TN
DATE 5-3-91 OPERATOR A
H C RANGE 1000 RESPONSE TIME

INITIAL CALIBRATION: (Accuracy ±5% of calibration gas value)

Gas Type	Actual Concentration	Analyzer	Gas Type	Actual Concentration	Analyzer
HC - Zero	O	-.1	HC - Mid	509	527.2
HC - High	765	774	HC - Low	262	272.1

ZERO & SPAN DRIFT: (Accuracy ±3% of span)

Run # 1	Time: 11:25-12:25	
Gas Type	Initial Response	Final Response
HC - Zero	-.1	-.7
HC -	527.2	526.8

Run #	Time:	
Gas Type	Initial Response	Final Response
HC- Zero		
HC -		

Run # 2	Time: 14:25-15:25	
Gas Type	Initial Response	Final Response
HC - Zero	-.7	0.3
HC -	526.8	527.0

Run #	Time:	
Gas Type	Initial Response	Final Response
HC- Zero		
HC -		

Run # 3	Time: 16:33-17:33	
Gas Type	Initial Response	Final Response
HC - Zero	~~-.5~~ 0.3	0.5
HC -	527.0	527.4

Run #	Time:	
Gas Type	Initial Response	Final Response
HC- Zero		
HC -		

INSTRUMENTAL ANALYSIS CALIBRATION DATA

DILUENT NO_x MONITORS

Plant Lehman-Roberts　　　　Location Memphis TN

Date 9-3-91　　　　Operator [illegible]

Initial Calibration　　(Accuracy: ± 2% Span)

Gas Type	Actual Concentration	Analyzer Response
NO_x-Zero	0.0	-.5
NO_x-High	845	848.7
NO_x-Mid	551	556.9

System Bias Reponse:　　Analyzer Response-Initial Bias = ± 5% Span
Final Bias - Initial Bias = ± 3% Span

Run # 1　　Time: 11:25-12:25

Gas Type	Initial Bias Response	Final Bias Response	Drift
Zero	-.5	.2	
NO_x	556.9	551.9	

Run # 2　　Time: 14:25-15:25

Gas Type	Initial Bias Response	Final Bias Response	Drift
Zero	.2	.5	
NO_x	551.9	554.5	

Run # 3　　Time: 16:33-17:33

Gas Type	Initial Bias Response	Final Bias Response	Drift
Zero	.5	.6	
NO_x	544.5	545.2	

Run #　　Time:

Gas Type	Initial Bias Response	Final Bias Response	Drift
Zero			
NO_x			

INSTRUMENTAL ANALYSIS CALIBRATION DATA

DILUENT SO_2 MONITORS

Plant Lehman-Roberts Location Memphis, TN

Date 9-3-91 Operator KA

Initial Calibration (Accuracy: ± 2% Span)

Gas Type	Actual Concentration	Analyzer Response
SO_2-Zero	0.0	-.3
SO_2-High	82.8	82.3
SO_2-Mid	57.3	57.6

System Bias Reponse: Analyzer Response-Initial Bias = ± 5% Span
Final Bias - Initial Bias = ± 3% Span

Run # 1 Time: 11:25-12:25

Gas Type	Initial Bias Response	Final Bias Response	Drift
Zero	-.3	-.5	
SO_2	57.6	57.4	

Run # 2 Time: 14:25-15:25

Gas Type	Initial Bias Response	Final Bias Response	Drift
Zero	-.5	-.3	
SO_2	57.4	57.4	

Run # 3 Time: 16:33-17:33

Gas Type	Initial Bias Response	Final Bias Response	Drift
Zero	-.3	-.4	
SO_2	57.4	57.3	

Run # Time:

Gas Type	Initial Bias Response	Final Bias Response	Drift
Zero			
SO_2			

IX. CALIBRATIONS

D. METHOD 5 SAMPLING EQUIPMENT

POSTTEST DRY GAS METER CALIBRATION DATA FORM (English units)

Test number ________ Date 10·3·91 Meter box number C-185 Plant ________

Barometric pressure, P_b = 29.99 in. Hg Dry gas meter number 638809 Pretest Y ________

Orifice manometer setting, (ΔH), in. H_2O	Gas volume: Wet test meter (V_w), ft^3	Gas volume: Dry gas meter (V_d), ft^3	Temperature: Wet test meter (t_w), °F	Temperature: Dry gas meter: Inlet (t_{d_i}), °F	Temperature: Dry gas meter: Outlet (t_{d_o}), °F	Temperature: Dry gas meter: Average[a] (t_d), °F	Time (θ), min	Vacuum setting, in. Hg	Y_i	$Y_i = \frac{V_w P_b (t_d + 460)}{V_d \left(P_b + \frac{\Delta H}{13.6}\right)(t_w + 460)}$
.5	~~10~~ 5	171.1 / 176.148	77	106 / 108	84 / 84	95.5	11.32		1.023	1.406
1	10	176.6 / 186.663	77	106 / 110	84 / 84	96	15.97		1.026	1.398
2	10	187.1 / 202.156	77	106 / 110	84 / 84	96	17.06		1.026	1.418
									Y = 1.025	1.407

[a] If there is only one thermometer on the dry gas meter, record the temperature under t_d

where

V_w = Gas volume passing through the wet test meter, ft^3.

V_d = Gas volume passing through the dry gas meter, ft^3.

t_w = Temperature of the gas in the wet test meter, °F.

t_{d_i} = Temperature of the inlet gas of the dry gas meter, °F.

t_{d_o} = Temperature of the outlet gas of the dry gas meter, °F.

t_d = Average temperature of the gas in the dry gas meter, obtained by the average of t_{d_i} and t_{d_o}, °F.

ΔH = Pressure differential across orifice, in. H_2O.

Y_i = Ratio of accuracy of wet test meter to dry gas meter for each run.

Y = Average ratio of accuracy of wet test meter to dry gas meter for all three runs; tolerance = pretest Y ± 0.05Y.

P_b = Barometric pressure, in. Hg.

θ = Time of calibration run, min.

POSTTEST DRY GAS METER CALIBRATION DATA FORM (English units)

Test number ________ Date 9-2-91 Meter box number C-185 Plant ________

Barometric pressure, P_b = ______ in. Hg Dry gas meter number 638809 Pretest Y ________

Orifice manometer setting, (ΔH), in. H_2O	Gas volume		Temperature							
	Wet test meter (V_w), ft^3	Dry gas meter (V_d), ft^3	Wet test meter (t_w), °F	Dry gas meter Inlet (t_{d_i}), °F	Dry gas meter Outlet (t_{d_o}), °F	Dry gas meter Average (t_d),[a] °F	Time (θ), min	Vacuum setting, in. Hg	Y_i	$Y_i = \frac{V_w P_b (t_d + 460)}{V_d \left(P_b + \frac{\Delta H}{13.6}\right)(t_w + 460)}$
.5	~~10~~ 5	160.7 / 166.772	73	98 / 91	75 / 76	87.5	13.66		1.014	1.414
1	10	167.6 / 177.733	77	96 / 100	76 / 76	87	16.04		1.01	1.405
2	10	179.5 / 184.627	73	96 / 102	76 / 76	87.5	11.46		1.009	1.433
									Y = 1.011	1.417

[a] If there is only one thermometer on the dry gas meter, record the temperature under t_d

where

V_w = Gas volume passing through the wet test meter, ft^3.

V_d = Gas volume passing through the dry gas meter, ft^3.

t_w = Temperature of the gas in the wet test meter, °F.

t_{d_i} = Temperature of the inlet gas of the dry gas meter, °F.

t_{d_o} = Temperature of the outlet gas of the dry gas meter, °F.

t_d = Average temperature of the gas in the dry gas meter, obtained by the average of t_{d_i} and t_{d_o}, °F.

ΔH = Pressure differential across orifice, in. H_2O.

Y_i = Ratio of accuracy of wet test meter to dry gas meter for each run.

Y = Average ratio of accuracy of wet test meter to dry gas meter for all three runs; tolerance = pretest Y $\pm$0.05Y.

P_b = Barometric pressure, in. Hg.

θ = Time of calibration run, min.

Form #REC-01

POSTTEST DRY GAS METER CALIBRATION DATA FORM (English units)

Test number ________ Date 7-30-91 Meter box number C-124 Plant ________

Barometric pressure, P_b = 30.02 in. Hg Dry gas meter number ________ Pretest Y ________

Orifice manometer setting, (ΔH), in. H_2O	Gas volume: Wet test meter (V_w), ft^3	Gas volume: Dry gas meter (V_d), ft^3	Temperature: Wet test meter (t_w), °F	Temperature: Dry gas meter: Inlet (t_{d_i}), °F	Temperature: Dry gas meter: Outlet (t_{d_o}), °F	Temperature: Dry gas meter: Average[a] (t_d), °F	Time (θ), min	Vacuum setting, in. Hg	Y_i	$Y_i = \frac{V_w P_b (t_d + 460)}{V_d \left(P_b + \frac{\Delta H}{13.6}\right)(t_w + 460)}$
.5	10	212 / 221.39	77	92 / 104	81 / 82	90.5	13.66		.959	2.062
1	10	221.5 / 232.02	77	90 / 110	84 / 84	92	19.23		.994	2.04
2	10	232.6 / 243.114	77	108 / 112	84 / 84	97	13.43		.982	2.031
									Y = .97	2.04

[a] If there is only one thermometer on the dry gas meter, record the temperature under t_d

where

V_w = Gas volume passing through the wet test meter, ft^3.

V_d = Gas volume passing through the dry gas meter, ft^3.

t_w = Temperature of the gas in the wet test meter, °F.

t_{d_i} = Temperature of the inlet gas of the dry gas meter, °F.

t_{d_o} = Temperature of the outlet gas of the dry gas meter, °F.

t_d = Average temperature of the gas in the dry gas meter, obtained by the average of t_{d_i} and t_{d_o}, °F.

ΔH = Pressure differential across orifice, in. H_2O.

Y_i = Ratio of accuracy of wet test meter to dry gas meter for each run.

Y = Average ratio of accuracy of wet test meter to dry gas meter for all three runs; tolerance = pretest Y ± 0.05Y.

P_b = Barometric pressure, in. Hg.

θ = Time of calibration run, min.

Form #REC-01

POSTTEST DRY GAS METER CALIBRATION DATA FORM (English units)

Test number ________ Date 10-13-91 Meter box number C-124 Plant ________

Barometric pressure, P_b = 30.12 in. Hg Dry gas meter number C4L882 Pretest Y ________

Orifice manometer setting, (ΔH), in. H_2O	Gas volume: Wet test meter (V_w), ft^3	Gas volume: Dry gas meter (V_d), ft^3	Temperature: Wet test meter (t_w), °F	Temperature: Dry gas meter: Inlet (t_{d_i}), °F	Temperature: Dry gas meter: Outlet (t_{d_o}), °F	Temperature: Dry gas meter: Average[a] (t_d), °F	Time (θ), min	Vacuum setting, in. Hg	Y_i	$Y_i = \frac{V_w P_b (t_d + 460)}{V_d \left(P_b + \frac{\Delta H}{13.6}\right)(t_w + 460)}$
1.0	10	642.44 / 653.15	73	108 / 110	84 / 84	96.5	19:02	5	0.975	1.55
1.5	10	631.53 / 642.145	73	106 / 110	80 / 82	94.5	15:32	5	0.976	1.55
2.0	10	620.533 / 631.027	73	102 / 107	77 / 78	91	13:18	5	0.981	1.52
									Y = 0.977	1.54

[a] If there is only one thermometer on the dry gas meter, record the temperature under t_d

where

V_w = Gas volume passing through the wet test meter, ft^3.
V_d = Gas volume passing through the dry gas meter, ft^3.
t_w = Temperature of the gas in the wet test meter, °F.
t_{d_i} = Temperature of the inlet gas of the dry gas meter, °F.
t_{d_o} = Temperature of the outlet gas of the dry gas meter, °F.

t_d = Average temperature of the gas in the dry gas meter, obtained by the average of t_{d_i} and t_{d_o}, °F.
ΔH = Pressure differential across orifice, in. H_2O.
Y_i = Ratio of accuracy of wet test meter to dry gas meter for each run.
Y = Average ratio of accuracy of wet test meter to dry gas meter for all three runs; *tolerance* = pretest Y ±0.05Y.
P_b = Barometric pressure, in. Hg.
θ = Time of calibration run, min.

Form #REC-01

AIR PRODUCTS AND CHEMICALS, INC.
4522 Industry Lane
UDI Business Park
Research Triangle Park, NC 27710
TELEPHONE (919) 361-2077
FAX (919) 361-2074

DATE: 06/14/90
TIME: 10:42
PAGE: 1

****
* CERTIFICATE OF ANALYSIS *
****

AIR PRODUCTS AND CHEMICALS, INC.
2541 HARBOR AVENUE
MEMPHIS TN 38113

CUSTOMER ACCOUNT : 351
CUSTOMER ORDER NO : GARY
ORDER NO : 351-038743
ORDER DETAIL SEQ : 5

REMARKS : GAS MIXTURE(S) LISTED BELOW ARE TRACEABLE TO NIST CLASS S WEIGHTS AND/OR NIST GAS MIXTURE STANDARD REFERENCE MATERIALS (SRM's) - REFERENCE APCI SGD FIELD DIRECTIVE BOOK I PART A-3.

** ANALYSIS **

CERTIFIED GAS MIXTURE: CARBON MONOXIDE IN NITROGEN

	CYL NO	COMPONENT REQUESTED	CONCENTRATION REQUESTED	ANALYTICAL RESULT	UNIT OF MEASURE
BATCH NO: [illegible] ANAL DATE: [illegible]/14/90	[illegible]	CARBON MONOXIDE NITROGEN	1000	980 BALANCE	MOLAR PPM
	[illegible]	CARBON MONOXIDE NITROGEN	1000	981 BALANCE	MOLAR PPM

RAMCON

CERTIFICATION

THIS ANALYSIS HAS BEEN PERFORMED UTILIZING APPROVED ANALYTICAL METHOD(S) AND IS CORRECT TO WITHIN THE ANALYTICAL ACCURACIES OF THIS (THESE) METHOD(S).

[signature]
AUTHORIZED SIGNATURE

[illegible]
4822 Industry Lane
UDI Business Park
Research Triangle Park, NC 27713
TELEPHONE (919) 361-2077
FAX (919) 361-2074

DATE: 07/26/90
TIME: 11:51
PAGE: 1

****
* CERTIFICATE OF ANALYSIS *
****

AIR PRODUCTS AND CHEMICALS, INC.
2541 HARBOR AVENUE
MEMPHIS TN 38113

CUSTOMER ACCOUNT : 351
CUSTOMER ORDER NO : GARY
ORDER NO : 351-041099
ORDER DETAIL SEQ : 1

REMARKS : GAS MIXTURE(S) LISTED BELOW ARE TRACEABLE TO NIST CLASS S WEIGHTS AND/OR NIST GAS MIXTURE STANDARD REFERENCE MATERIALS (SRM's) - REFERENCE APCI SGD FIELD DIRECTIVE BOOK I PART A-3.

** ANALYSIS **

CERTIFIED GAS MIXTURE: CARBON MONOXIDE IN NITROGEN

	CYL NO	COMPONENT REQUESTED	CONCENTRATION REQUESTED	ANALYTICAL RESULT	UNIT OF MEASURE
BATCH NO: 00472	[illegible]	CARBON MONOXIDE	300	308	MOLAR PPM
ANAL DATE: 07/26/90		NITROGEN		BALANCE	

CERTIFICATION

THIS ANALYSIS HAS BEEN PERFORMED UTILIZING APPROVED ANALYTICAL METHOD(S) AND IS CORRECT TO WITHIN THE ANALYTICAL ACCURACIES OF THIS (THESE) METHOD(S).

AUTHORIZED SIGNATURE

RM 3806-1 (REV 1/88)

Research Triangle Park, NC 27709
TELEPHONE (919) 361-2077
FAX (919) 361-2074

* CERTIFICATE OF ANALYSIS *

AIR PRODUCTS AND CHEMICALS, INC.
2541 HARBOR AVENUE
MEMPHIS TN 38113

CUSTOMER ACCOUNT : [illegible]
CUSTOMER ORDER NO : GARY
ORDER NO : [illegible]
ORDER DETAIL SEQ : 2

REMARKS : GAS MIXTURE(S) LISTED BELOW ARE TRACEABLE TO NIST CLASS S WEIGHTS AND/OR NIST GAS MIXTURE STANDARD REFERENCE MATERIALS (SRM's) - REFERENCE APCI SGD FIELD DIRECTIVE BOOK I PART A-3.

** ANALYSIS **

CERTIFIED GAS MIXTURE: CARBON MONOXIDE IN NITROGEN

	CYL NO	COMPONENT REQUESTED	CONCENTRATION REQUESTED	ANALYTICAL RESULT	UNIT OF MEASURE
BATCH NO: 90474	SG867726NB	CARBON MONOXIDE	500	498	MOLAR PPM
ANAL DATE: 07/26/90		NITROGEN		BALANCE	

Post-it™ brand fax transmittal memo 7671	# of pages ▸ 3
To Joel Sewel	From Cathy
Co. Ramcon	Co. APCI-Durham
Dept.	Phone # 1-919-361-4645
Fax # 1-901-458-3868	Fax # 1-919-361-2074

CERTIFICATION

THIS ANALYSIS HAS BEEN PERFORMED UTILIZING APPROVED ANALYTICAL METHOD(S) AND IS CORRECT TO WITHIN THE ANALYTICAL ACCURACIES OF THIS (THESE) METHOD(S).

AUTHORIZED SIGNATURE

AIR PRODUCTS AND CHEMICALS, INC.
4920 Industry Lane
CBI Business Park
Research Triangle Park, NC 27713
TELEPHONE (919) 361-2077
FAX (919) 361-2074

DATE: 02/26/91
TIME: 11:51
PAGE: 1

****

** CERTIFICATE OF ANALYSIS *

****

AIR PRODUCTS AND CHEMICALS, INC.
3541 HARBOR AVENUE
MEMPHIS TN 38113

CUSTOMER ACCOUNT : 351
CUSTOMER ORDER NO : GARY
ORDER NO : 351-957503
ORDER DETAIL SEQ : 2

REMARKS : GAS MIXTURE(S) LISTED BELOW ARE TRACEABLE TO NIST CLASS S WEIGHTS AND/OR NIST GAS MIXTURE STANDARD REFERENCE MATERIALS (SRM's) - REFERENCE APCI SGD FIELD DIRECTIVE BOOK I PART A-3.

** ANALYSIS **

CERTIFIED GAS MIXTURE: CARBON DIOXIDE IN NITROGEN

	C/L NO	COMPONENT REQUESTED	CONCENTRATION REQUESTED	ANALYTICAL RESULT	UNIT OF MEASURE
BATCH NO: 40838	58.127.1P	CARBON DIOXIDE	17	17.2	MOLAR %
ANAL DATE: 02/26/91		NITROGEN		BALANCE	
	0584756	CARBON DIOXIDE	17	17.0	MOLAR %
		NITROGEN		BALANCE	

RAMCON

CERTIFICATION

THIS ANALYSIS HAS BEEN PERFORMED UTILIZING APPROVED ANALYTICAL METHOD(S) AND IS CORRECT TO WITHIN THE ANALYTICAL ACCURACIES OF THIS (THESE) METHOD(S).

AUTHORIZED SIGNATURE

FORM 3806-1 (REV. 8/88)

AIR PRODUCTS AND CHEMICALS, INC.
4822 Industry Lane
UDI Business Park
Research Triangle Park, NC 27713
TELEPHONE (919) 361-2077
FAX (919) 361-2074

DATE: 06/17/91
TIME: 12:01
PAGE: 1

0045

0

CERTIFICATE OF ANALYSIS

AIR PRODUCTS AND CHEMICALS, INC.
2541 HARBOR AVENUE
MEMPHIS TN 38113

CUSTOMER ACCOUNT : 351
CUSTOMER ORDER NO : GARY
ORDER NO : 351-064150
ORDER DETAIL SEQ : 11

REMARKS : GAS MIXTURE(S) LISTED BELOW ARE TRACEABLE TO NIST CLASS S WEIGHTS AND/OR NIST GAS MIXTURE STANDARD REFERENCE MATERIALS (SRM's) - REFERENCE APCI SGD FIELD DIRECTIVE BOOK I PART A-3.

** ANALYSIS **

CERTIFIED GAS MIXTURE: 2 COMPONENTS IN NITROGEN

	CYL NO	COMPONENT REQUESTED	CONCENTRATION REQUESTED	ANALYTICAL RESULT	UNIT OF MEASURE
BATCH NO: 03764 ANAL DATE: 06/14/91	SG0306348	CARBON DIOXIDE	10	10.5	MOLAR %
		OXYGEN	10	10.2	MOLAR %
		NITROGEN		BALANCE	

RAMCON

CERTIFICATION

THIS ANALYSIS HAS BEEN PERFORMED UTILIZING APPROVED ANALYTICAL METHOD(S) AND IS CORRECT TO WITHIN THE ANALYTICAL ACCURACIES OF THIS (THESE) METHOD(S).

AUTHORIZED SIGNATURE

FORM 3806-1 (REV. 8/88)

AIR PRODUCTS AND CHEMICALS, INC.
4822 Industry Lane
UDI Business Park
Research Triangle Park, NC 27713
TELEPHONE (919) 361-2077
FAX (919) 361-2074

DATE: 06/03/91
TIME: 10:49
PAGE: 1

* CERTIFICATE OF ANALYSIS *

AIR PRODUCTS AND CHEMICALS, INC.
2541 HARBOR AVENUE
MEMPHIS TN 38113

CUSTOMER ACCOUNT : 351
CUSTOMER ORDER NO : GARY
ORDER NO : 351-063526
ORDER DETAIL SEQ : 3

REMARKS : GAS MIXTURE(S) LISTED BELOW ARE TRACEABLE TO NIST CLASS S WEIGHTS AND/OR NIST GAS MIXTURE STANDARD REFERENCE MATERIALS (SRM's) - REFERENCE APCI SQD FIELD DIRECTIVE BOOK I PART A-3.

** ANALYSIS **

CERTIFIED GAS MIXTURE: METHANE IN NITROGEN

	CYL NO	COMPONENT REQUESTED	CONCENTRATION REQUESTED	ANALYTICAL RESULT	UNIT OF MEASURE
BATCH NO: 03643	38198168	METHANE	850	765	MOLAR PPM
ANAL DATE: 06/03/91		NITROGEN		BALANCE	

RAMCON 6-20-91

CERTIFICATION

THIS ANALYSIS HAS BEEN PERFORMED UTILIZING APPROVED ANALYTICAL METHOD(S) AND IS CORRECT TO WITHIN THE ANALYTICAL ACCURACIES OF THIS (THESE) METHOD(S).

AUTHORIZED SIGNATURE

M 3806-1 (REV. 8/88)

AIR PRODUCTS AND CHEMICALS, INC.
4822 Industry Lane
UDC Business Park
Research Triangle Park, NC 27713
TELEPHONE (919) 361-2077
FAX (919) 361-2074

DATE: 06/03/91
TIME: 10:49
PAGE: 1

5)

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* CERTIFICATE OF ANALYSIS *
****

AIR PRODUCTS AND CHEMICALS, INC.
2541 HARBOR AVENUE
MEMPHIS TN 38113

CUSTOMER ACCOUNT : 351
CUSTOMER ORDER NO : GARY
ORDER NO : 351-060526
ORDER DETAIL SEQ : 1

REMARKS : GAS MIXTURE(S) LISTED BELOW ARE TRACEABLE TO NIST CLASS S WEIGHTS AND/OR NIST GAS MIXTURE STANDARD REFERENCE MATERIALS (SRM's) - REFERENCE APCI SGD FIELD DIRECTIVE BOOK I PART A-3.

** ANALYSIS **

CERTIFIED GAS MIXTURE: METHANE IN NITROGEN

	CYL NO	COMPONENT REQUESTED	CONCENTRATION REQUESTED	ANALYTICAL RESULT	UNIT OF MEASURE
BATCH NO: 03642	SG0159928	METHANE	250	262	MOLAR PPM
ANAL DATE: 06/03/91		NITROGEN		BALANCE	

RAMCON 6-20-91

CERTIFICATION

THIS ANALYSIS HAS BEEN PERFORMED UTILIZING APPROVED ANALYTICAL METHOD(S) AND IS CORRECT TO WITHIN THE ANALYTICAL ACCURACIES OF THIS (THESE) METHOD(S).

AUTHORIZED SIGNATURE

FORM 3806-1 (REV. 8/88)

AIR PRODUCTS AND CHEMICALS, INC.
4622 Industry Lane
UDI Business Park
Research Triangle Park, NC 27713
TELEPHONE (919) 361-2077
FAX (919) 361-2074

TIME: 10:48
PAGE: 1

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* CERTIFICATE OF ANALYSIS *
****

AIR PRODUCTS AND CHEMICALS, INC.
2541 HARBOR AVENUE
MEMPHIS TN 38113

CUSTOMER ACCOUNT : 351
CUSTOMER ORDER NO : GARY
ORDER NO : 351-063526
ORDER DETAIL SEQ : 2

REMARKS : GAS MIXTURE(S) LISTED BELOW ARE TRACEABLE TO NIST CLASS S WEIGHTS AND/OR NIST GAS MIXTURE STANDARD REFERENCE MATERIALS (SRM's) - REFERENCE APCI SGD FIELD DIRECTIVE BOOK I PART A-3.

** ANALYSIS **

CERTIFIED GAS MIXTURE: METHANE IN NITROGEN

	CYL NO	COMPONENT REQUESTED	CONCENTRATION REQUESTED	ANALYTICAL RESULT	UNIT OF MEASURE
BATCH NO: 03641	SG119528	METHANE	500	509	MOLAR PPM
ANAL DATE: 06/03/91		NITROGEN		BALANCE	

RAMCON 6·20·91

CERTIFICATION

THIS ANALYSIS HAS BEEN PERFORMED UTILIZING APPROVED ANALYTICAL METHOD(S) AND IS CORRECT TO WITHIN THE ANALYTICAL ACCURACIES OF THIS (THESE) METHOD(S).

AUTHORIZED SIGNATURE

4822 Industry Lane
UDI Business Park
Research Triangle Park, NC 27713
TELEPHONE (919) 361-2077
FAX (919) 361-2074

*** CERTIFICATE OF ANALYSIS ***

AIR PRODUCTS AND CHEMICALS, INC.
3341 HARBOR AVENUE
MEMPHIS TN 38113

CUSTOMER ACCOUNT : 351
CUSTOMER ORDER NO : GARY
ORDER NO : 351-042571
ORDER DETAIL SEQ : 2

** ANALYSIS **

CERTIFIED GAS MIXTURE: NITRIC OXIDE IN NITROGEN

	CYL. NO.	COMPONENT REQUESTED	CONCENTRATION REQUESTED	ANALYTICAL RESULT	UNIT OF MEASURE
BATCH NO: 00684	[illegible]	NITRIC OXIDE	850	845	MOLAR PPM
ANAL DATE: [illegible]		Nitrogen Dioxide		9.5	MOLAR PPM
		NITROGEN		BALANCE	

CERTIFICATION

THIS ANALYSIS HAS BEEN PERFORMED UTILIZING [illegible] ANALYTICAL METHOD(S) AND IS CORRECT TO WITHIN THE ANALYTICAL ACCURACIES OF THIS (THESE) METHOD(S).

AUTHORIZED SIGNATURE

A 3808-1 (REV. 8/88)

AIR PRODUCTS AND CHEMICALS, INC.
4822 Industry Lane
UDI Business Park
Research Triangle Park, NC 27713
TELEPHONE (919) 361-2077
FAX (919) 361-2074

DATE: 08/24/90
TIME: 14:53
PAGE: 1

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* CERTIFICATE OF ANALYSIS *
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AIR PRODUCTS AND CHEMICALS, INC.
2541 HARBOR AVENUE
MEMPHIS TN 38113

CUSTOMER ACCOUNT : 351
CUSTOMER ORDER NO : GARY
ORDER NO : 351-042705
ORDER DETAIL SEQ : 4

** ANALYSIS **

CERTIFIED GAS MIXTURE: NITRIC OXIDE IN NITROGEN

	CYL NO	COMPONENT REQUESTED	CONCENTRATION REQUESTED	ANALYTICAL RESULT	UNIT OF MEASURE
BATCH NO: 00935	SG9006a4ALB	NITRIC OXIDE	550	551	MOLAR PPM
ANAL DATE: 08/24/90		Nitrogen Dioxide		9	MOLAR PPM
		NITROGEN		BALANCE	

49

CERTIFICATION

THIS ANALYSIS HAS BEEN PERFORMED UTILIZING APPROVED ANALYTICAL METHOD(S) AND IS CORRECT TO WITHIN THE ANALYTICAL ACCURACIES OF THIS (THESE) METHOD(S).

AUTHORIZED SIGNATURE

FORM 3806-1 (REV. 8/88)

AIR PRODUCTS AND CHEMICALS, INC.
4820 Industry Lane
UDI Business Park
Research Triangle Park, NC 27713
TELEPHONE (919) 361-2077
FAX (919) 361-2074

DATE: 02/15/91
TIME: 16:30
PAGE: 1

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* CERTIFICATE OF ANALYSIS *
****

AIR PRODUCTS AND CHEMICALS, INC.
2541 HARBOR AVENUE
MEMPHIS TN 38113

CUSTOMER ACCOUNT : 351
CUSTOMER ORDER NO : GARY
ORDER NO : 351-[illegible]
ORDER DETAIL SEQ : 3

** ANALYSIS **

CERTIFIED GAS MIXTURE: SULFUR DIOXIDE IN NITROGEN

	CYL NO	COMPONENT REQUESTED	CONCENTRATION REQUESTED	ANALYTICAL RESULT	UNIT OF MEASURE
BATCH NO: 0C580 ANAL DATE: 02/11/91	SG9[illegible]ALB	SULFUR DIOXIDE	25	30.9	MOLAR PPM
		NITROGEN		BALANCE	

RAMCON

CERTIFICATION

THIS ANALYSIS HAS BEEN PERFORMED UTILIZING APPROVED ANALYTICAL METHOD(S) AND IS CORRECT TO WITHIN THE ANALYTICAL ACCURACIES OF THIS (THESE) METHOD(S).

[signature]
AUTHORIZED SIGNATURE

FORM 3806-1 (REV. 8/88)

AIR PRODUCTS AND CHEMICALS, INC.
4822 Industry Lane
UDI Business Park
Research Triangle Park, NC 27713
TELEPHONE (919) 361-2077
FAX (919) 361-2074

DATE: 04/10/91
TIME: 12:04
PAGE: 1

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* CERTIFICATE OF ANALYSIS *
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AIR PRODUCTS AND CHEMICALS, INC.
2541 HARBOR AVENUE
MEMPHIS TN 38113

CUSTOMER ACCOUNT : 351
CUSTOMER ORDER NO : GARY
ORDER NO : 351-059075
ORDER DETAIL SEQ : 1

** ANALYSIS **

CERTIFIED GAS MIXTURE: SULFUR DIOXIDE IN NITROGEN

	CYL NO	COMPONENT REQUESTED	CONCENTRATION REQUESTED	ANALYTICAL RESULT	UNIT OF MEASURE
BATCH NO: 03126	SG1123NB	SULFUR DIOXIDE	55	57.3	MOLAR PPM
ANAL DATE: 04/03/91		NITROGEN		BALANCE	

CERTIFICATION

THIS ANALYSIS HAS BEEN PERFORMED UTILIZING APPROVED ANALYTICAL METHOD(S) AND IS CORRECT TO WITHIN THE ANALYTICAL ACCURACIES OF THIS (THESE) METHOD(S).

Patrick J. Kutcher

AUTHORIZED SIGNATURE

Name: Mr. G. Sumner Buck, III
Title: President

Qualifications:

Mr. Buck is a graduate of the University of Mississippi with graduate studies at Memphis State University and State Technical Institute of Memphis. He is a graduate of the EPA 450 "Source Sampling for Particulate Pollutant's" course and the 474 "Continuous Emissions Monitoring" courses outlined by EPA at Research Triangle Park, N.C. He has been directly involved in conducting and supervising air emission testing for over 15 years. He has personally conducted over 400 air emission tests. He currently sponsors and directs visual emission certification schools for US EPA Method 9.

Project Duties:

Mr. Buck will be responsible for the overall supervision of the project. He provided supervision for the project preparation, testing schedules for each team on-site, and overall organization between the testing crews and facility.

Name: Mr. Ken Allmendinger
Title: Field Supervisor

Qualifications:

Mr. Allmendinger is currently our Field Supervisor. He provides leadership to other Team Leaders when projects require multiple teams on site as well as coordinating with plant personnel. He has been employed with RAMCON Environmental Corporation for over six years. During that time he has personally conducted over 500 air emission tests. He has extensive training in conducting both isokinetic and instrumental US EPA Reference Methods. He has a current V.E. certification to conduct Method 9 for opacity. He has attended several equipment manufacturers schools for further knowledge of the processes he is testing.

Project Duties:

Mr. Allmendinger provided project leadership at the facility. He provided on-site organization for each Team Leader as to his crews responsibilities as well as providing coordination of testing time periods with the plant personnel.

Name: Mr. Ray Jenkins
Title: Team Leader - Instrumental

Qualifications:

Mr. Jenkins is the Team Leader for our gas chromatography sampling team. He is a graduate of Memphis State University where he obtained a bachelor of science degree with a major emphasis in chemistry. He also serves as a laboratory technician for various specialized analysis procedures conducted in our laboratory. He has experience in conducting the full scope of isokinetic test methods, however he specializes in portable gas chromatography instrumentation methodology. He currently is certified to conduct Method 9 for opacity.

Project Duties:

Mr. Jenkins served as the Team Leader for the testing procedures. He was responsible for conducting the calibration and operation of the gas chromatograph.

Name: Mr. Joe Sewell
Title: Instrumentation Director

Qualifications:

Mr. Sewell is the director of our instrumental analysis branch of air emissions testing. He is a graduate of Christian Brothers University in Memphis, Tennessee where he obtained a bachelor of science degree in Chemical Engineering. He has personally conducted and supervised air emissions testing of boilers, incinerators, refineries, etc. utilizing state of the art continuous instrumentation and gas chromatography. He is learned in all US EPA methods with expertise in instrumental techniques for conducting compliance tests and Performance Specifications for CEMS certifications.

Project Duties:

Mr. Sewell provided project leadership for all test procedures conducted at the facility. He is the Quality Assurance/Quality Control Coordinator and will provided guidance in QA/QC to each team leader with regard to individual responsibilities on site for all testing procedures. He acted as a secondary contact person for RAMCON Environmental Corporation.

Name: **Mr. Bill Lockett**
Title: Team Leader

Qualifications:

Mr. Lockett has been employed by RAMCON Environmental Corp. for three years. He has recently completed Team Leader training in isokinetic and proportional test methods. He currently is certified in conducting Method 9 for opacity. He has been involved in conducting tests on process stacks, incinerators, boilers, etc. He has served as a Field Technician for over two years, however he has recently been upgraded to Team Leader.

Project Duties:

Mr. Lockett is responsible for conducting isokinetic sampling procedures at the facility(s). He is responsible for preparation, calibration and cleaning of the necessary equipment for this testing. His duties on-site include assembling the sample train, leak checking the system, operation of the train and recording the test data on the field data forms.

Name: Mr. Tim Huey
Title: Laboratory Technician

Qualifications:

Mr. Huey is currently serving as Laboratory Technician. He is proficient in conducting many analysis procedures such as front and back-half particulate analysis, titrations, extractions, etc. He received an associate degree in Chemical Engineering from State Technical Institute in Memphis.

Project Duties:

Mr. Huey conducts the laboratory analysis on the particulate samples. He is also responsible for accepting the remaining field samples from the Field Sample Bank Manager and performing inspection as to integrity. He documents the transfer on the chain of custody forms and distributed the subcontracted samples to the respective laboratories.

Name: Mr. Charles Crook
Title: Team Leader

Qualifications:

Mr. Crook has been employed by RAMCON Environmental Corp. for three years. He has recently completed Team Leader training in isokinetic and proportional test methods. He currently is certified in conducting Method 9 for opacity. He has been involved in conducting tests on process stacks, incinerators, boilers, etc. He has served as a Field Technician for over two years, however he has recently been upgraded to Team Leader.

Project Duties:

Mr. Crook is responsible for conducting isokinetic sampling procedures at the facility(s). He is responsible for preparation, calibration and cleaning of the necessary equipment for this testing. His duties on-site include assembling the sample train, leak checking the system, operation of the train and recording the test data on the field data forms.