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ETC ENVIRONMENTAL TESTING and CERTIFICATION

Technical Report

for

ENVIRONMENTAL STRATEGIES CORP.

WASHINGTON HARBOUR

3050 KK ST. SUITE 325

WASHINGTON, DC 20007

Chain of Custody Data Required for ETC Data Management Summary Reports

ETC Sample No.	Company	Facility	Sample Point	Date	Time	Elapsed Hours
P4850	ENVIRONMENTAL STRATEGIES CORP.	CHAMPION	WCSP-1	861110	1100	

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Vice President
Research and Operations

This Technical Report is an INSITE℠ service generated by LODESTAR℠ Data Management Software.

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Introduction

This report contains the analytical results on your sample. It is designed to include comprehensive data from the entire analytical process in order to satisfy the needs of various levels of review.

The results obtained from your sample are presented in tabular format immediately following this introduction. Quality assurance data is tabulated along with the appropriate sample results for verification. Depending on the analyses ordered, the quality assurance data may include results from blank, spiked blank, spiked sample (i.e. matrix spike) and replicate sample as well as results from surrogate compound analyses. Quality assurance data for verification of proper instrument performance is also included where appropriate. The report appendices include the chain of custody record for your sample and, where appropriate, the gas chromatograms and mass spectra.

The procedures used in the analysis of the sample are described in this report's methodology section. All analytical procedures within our laboratory are performed within a strictly enforced Quality Assurance Protocol. A description of this Protocol is included in the report.

Results

Sample results, and associated quality assurance data, are always tabulated in one or more of this report's Quantitative Results Tables. The format of each table varies with the class of analysis.

Priority Pollutants

The priority pollutant compounds and elements are listed with their NPDES (National Pollution Discharge Elimination System) numbers, and the Method Detection Limit (MDL) published in the Federal Register. When a compound or element is present below its published MDL it is reported as BMDL (Below Method Detection Limit). When a compound or element is not present at any detectable concentrations it is reported as ND (Not Detected). MDL's for non-aqueous matrices are based on USEPA published MDL's but are adjusted as per sample weight. Matrix spike and replicate analyses, where included, were performed on samples randomly chosen within each quality assurance batch and are therefore not necessarily spikes and replicates of this report's sample. Surrogate compound recovery data and instrument calibration data are included in the Method Performance Data Tables.

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NOV 26, 1986

TABLE 1: QUANTITATIVE RESULTS and QUALITY ASSURANCE DATA

Volatile Compounds - GC/MS Analysis Data (QR01)

Chain of Custody Data Required for ETC Data Management Summary Reports

ETC Sample No.	Company	Facility	Sample Point	Date	Time	Elapsed Hours
P4850	ENVIRONMENTAL STRATEGIES CORP.	CHAMPION	WCSP-1	861110	1100	

NPDES Number	Compound (Acrolein and Acrylonitrile values are screen only.)	Results		QC Replicate		QC Blank and Spiked Blank			QC Matrix Spike		
		Sample Concen. ug/l	MDL ug/l	First ug/l	Second ug/l	Blank Data ug/l	Concen. Added ug/l	% Recov	Unspiked Sample ug/l	Concen. Added ug/l	% Recov
1V	Acrolein	ND	100	ND	ND	ND	800	88	ND	800	98
2V	Acrylonitrile	ND	100	ND	ND	ND	80.0	94	ND	80.0	84
3V	Benzene	ND	4.4	ND	ND	ND	18.0	99	ND	18.0	100
4V	bis(Chloromethyl)ether	ND	10	ND	ND	ND	0	-	ND	0	-
5V	Bromoform	ND	4.7	ND	ND	ND	18.0	92	ND	18.0	90
6V	Carbon tetrachloride	ND	2.8	ND	ND	ND	18.0	103	ND	18.0	98
7V	Chlorobenzene	ND	6.0	ND	ND	ND	18.0	99	ND	18.0	99
8V	Chlorodibromomethane	ND	3.1	ND	ND	ND	18.0	99	ND	18.0	95
9V	Chloroethane	ND	10	ND	ND	ND	18.0	103	ND	18.0	96
10V	2-Chloroethylvinyl ether	ND	10	ND	ND	ND	18.0	0R	ND	18.0	0R
11V	Chloroform	ND	1.6	ND	ND	ND	18.0	103	ND	18.0	98
12V	Dichlorobromomethane	ND	2.2	ND	ND	ND	18.0	100	ND	18.0	96
13V	Dichlorodifluoromethane	ND	10	ND	ND	ND	18.0	109	ND	18.0	104
14V	1,1-Dichloroethane	ND	4.7	ND	ND	ND	18.0	100	ND	18.0	99
15V	1,2-Dichloroethane	ND	2.8	ND	ND	ND	18.0	104	ND	18.0	96
16V	1,1-Dichloroethylene	ND	2.8	ND	ND	ND	18.0	101	ND	18.0	97
17V	1,2-Dichloropropane	ND	6.0	ND	ND	ND	18.0	98	ND	18.0	101
18V	cis-1,3-Dichloropropylene	ND	5.0	ND	ND	ND	18.0	97	ND	18.0	100
19V	Ethylbenzene	ND	7.2	ND	ND	ND	18.0	100	ND	18.0	100
20V	Methyl bromide	ND	10	ND	ND	ND	18.0	103	ND	18.0	109
21V	Methyl chloride	ND	10	ND	ND	ND	18.0	107	ND	18.0	109
22V	Methylene chloride	ND	2.8	209	206	3.93	18.0	98	45.0	18.0	89
23V	1,1,2,2-Tetrachloroethane	ND	6.9	ND	ND	ND	18.0	101	ND	18.0	106
24V	Tetrachloroethylene	ND	4.1	ND	ND	ND	18.0	98	ND	18.0	103
25V	Toluene	ND	6.0	ND	ND	ND	18.0	100	ND	18.0	102
26V	1,2-Trans-dichloroethylene	ND	1.6	ND	ND	ND	18.0	97	ND	18.0	99
27V	1,1,1-Trichloroethane	ND	3.8	ND	ND	ND	18.0	104	ND	18.0	97
28V	1,1,2-Trichloroethane	ND	5.0	ND	ND	ND	18.0	104	ND	18.0	100
29V	Trichloroethylene	ND	1.9	ND	ND	ND	18.0	93	ND	18.0	87
30V	Trichlorofluoromethane	ND	10	ND	ND	ND	18.0	105	ND	18.0	99
31V	Vinyl chloride	ND	10	ND	ND	ND	18.0	110	ND	18.0	99
18V	trans-1,3-Dichloropropylene	ND	10	ND	ND	ND	18.0	94	ND	18.0	96

R Recovery normally variable using established methodology.

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NOV 29, 1986

TABLE 1: QUANTITATIVE RESULTS

Metals - Analysis Data (QR52)

Chain of Custody Data Required for ETC Data Management Summary Reports

ETC Sample No.	Company	Facility	Sample Point	Date	Time	Elapsed Hours
P4850	ENVIRONMENTAL STRATEGIES CORP	CHAMPION	WCSP-1	861110	1100	

Compound	Results											
	Sample Concen. ug/l	MDL ug/l										
Barium	32	3.2										
Chromium	ND	26										
Copper	BMDL	13										
Iron	BMDL	140										
Manganese	BMDL	6.4										
Nickel	ND	11										
Sodium	9110	72										
Zinc	29	2.9										

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DEC 20, 1986

TABLE 1: QUANTITATIVE RESULTS and QUALITY ASSURANCE DATA

Conventional Analysis Data (QR10)

Chain of Custody Data Required for ETC Data Management Summary Reports

ETC Sample No.	Company	Facility	Sample Point	Date	Time	Elapsed Hours
P4850	ENVIRONMENTAL STRATEGIES CORP.	CHAMPION	WCSP-1	861110	1100	

NPDES Number	Results									
	Sample Concen. mg/l	MDL mg/l								
Fluoride	.16	.10								
Nitrate as N	5.50	.10								
Sulfate as S04	85	2								
Phenolics, Total	<.050	.050								
Cyanide, Total	.539	.025								
Solids, total suspended	490	2								

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ETC ENVIRONMENTAL TESTING and CERTIFICATION

NOV 25, 1986

TABLE 2: METHOD PERFORMANCE DATA
Surrogate Recovery - Aqueous Matrices (QR20)

Chain of Custody Data Required for ETC Data Management Summary Reports

ETC Sample No.	Company	Facility	Sample Point	Date	Time	Elapsed Hours
P4850	ENVIRONMENTAL STRATEGIES CORP.	CHAMPION	WCSP-1	86111	1100	0

Compound	Amount added ug	% Recovery	Control Limits* Lower	Control Limits* Upper
VOLATILE FRACTION (GC/MS)				
Toluene-D8	.250	100	88	110
p-Bromofluorobenzene	.250	104	86	115
1,2-Dichloroethane-D4	.250	108	76	114
ACID FRACTION (GC/MS)				
Phenol-D5	-	-	10	94
2-Fluorophenol	-	-	21	100
2,4,6-Tribromophenol	-	-	10	123
BASE/NEUTRAL FRACTION (GC/MS)				
Nitrobenzene-D5	-	-	35	114
2-Fluorobiphenyl	-	-	43	116
Terphenyl-D14	-	-	33	141
PESTICIDE/PCB FRACTION (GC)				
Dibutylchlorendate	-	-	24**	154**

* IFB EPA Control Limits
** Advisory Limits Only.

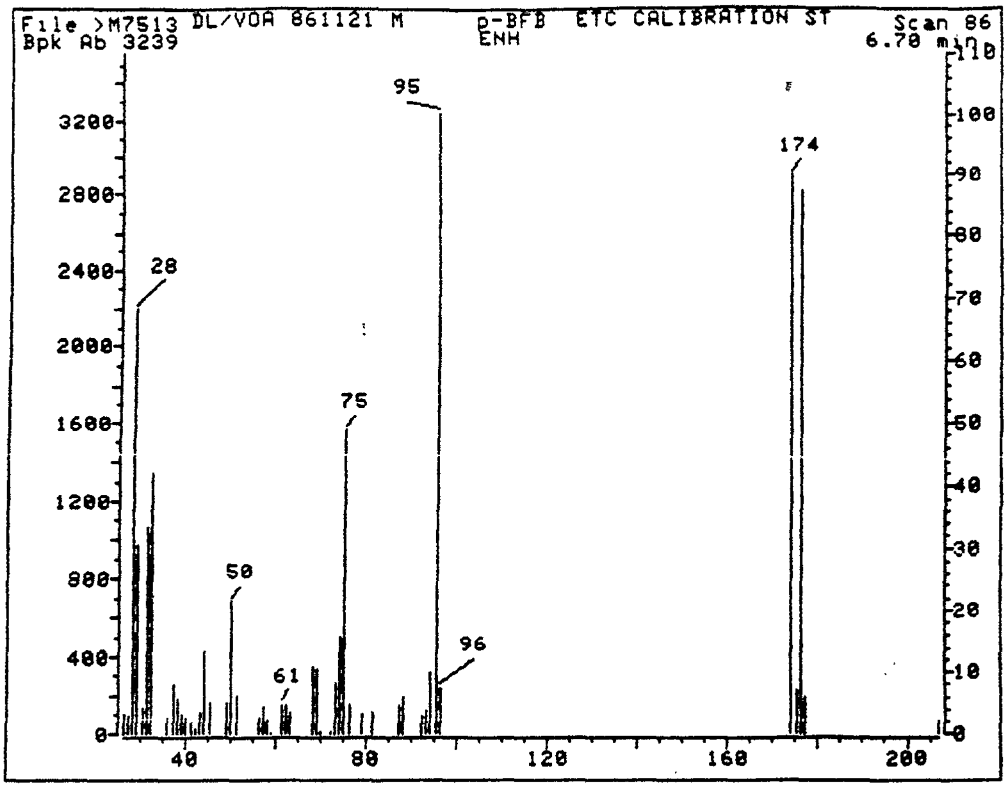

TABLE 2: METHOD PERFORMANCE DATA (QR21)

GC/MS Tuning Data - Bromofluorobenzene (BFB) for Volatiles Analysis

m/z	Ion Abundance Criteria	% Relative Abundance Base Peak	% Relative Abundance Appropriate Peak	Status
50	15-40% of mass 95	21.09	21.09	Ok
75	30-60% of mass 95	48.39	48.39	Ok
95	Base peak, 100% relative abundance	100.00	100.00	Ok
96	5-9% of mass 95	7.22	7.22	Ok
173	Less than 1% of mass 95	0.00	0.00	Ok
174	Greater than 50% of mass 95	89.98	89.98	Ok
175	5-9% of mass 174	6.74	7.49	Ok
176	95-101% of mass 174	87.27	96.99	Ok
177	5-9% of mass 176	5.98	6.86	Ok

Injection Date: 11/21/86   Analyst: [illegible]
Injection Time: 20:42   Processor: [illegible]
Run No: >M7513   QC Batch: QV 5431
Spectrun No: 86   Samples: P4240, P4241, P4242, P4243, P4244, P4236, P4237, P4239, P4235, P533[illegible], P5415, P5414, P4850, P4851, P4852

11/25/86

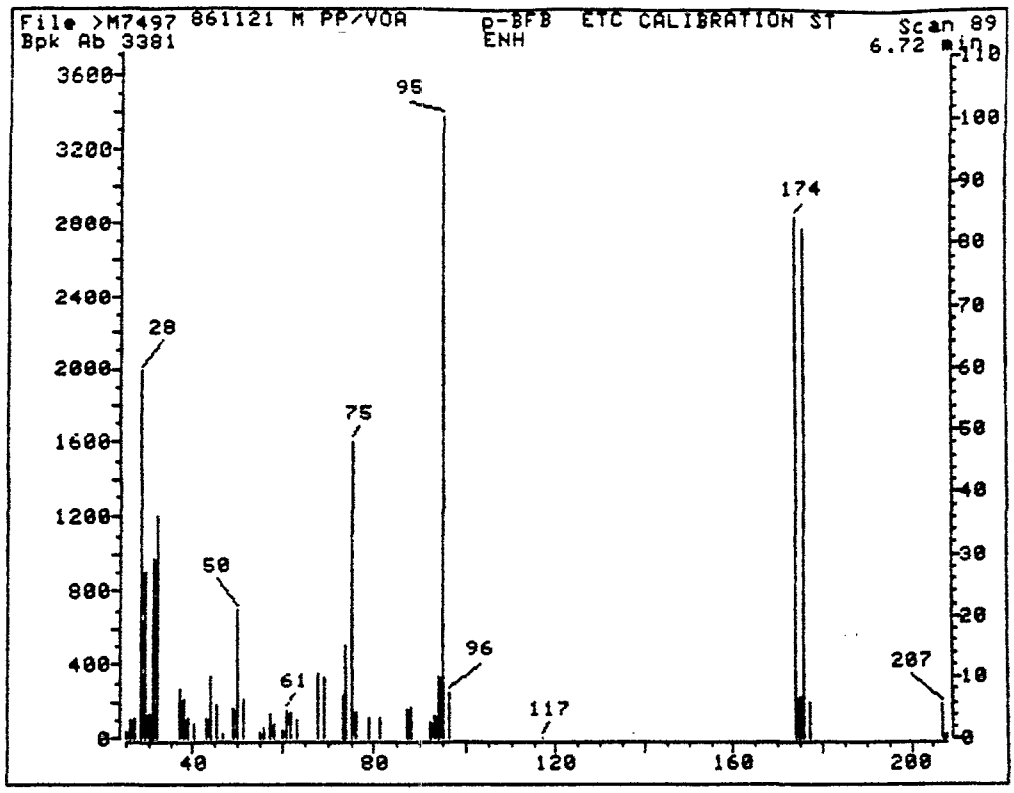

TABLE 2: METHOD PERFORMANCE DATA (QR21)

GC/MS Tuning Data - Bromofluorobenzene (BFB) for Volatiles Analysis

m/z	Ion Abundance Criteria	% Relative Abundance Base Peak	Appropriate Peak	Status
50	15-40% of mass 95	20.80	20.80	Ok
75	30-60% of mass 95	47.52	47.52	Ok
95	Base peak, 100% relative abundance	100.00	100.00	Ok
96	5-9% of mass 95	7.18	7.18	Ok
173	Less than 1% of mass 95	0.00	0.00	Ok
174	Greater than 50% of mass 95	83.99	83.99	Ok
175	5-9% of mass 174	6.60	7.85	Ok
176	95-101% of mass 174	82.16	97.82	Ok
177	5-9% of mass 176	5.86	7.13	Ok

Injection Date: 11/21/86
Injection Time: 05:57
Run No: >M7497
Spectrun No: 89

Analyst: [signature]
Processor: [illegible]
QC Batch: QV5931
Samples: P4240, P4241, P4242, P4243, P4236, P4237, P4239, P4235, P5415, P5414, P4850, P4851, P

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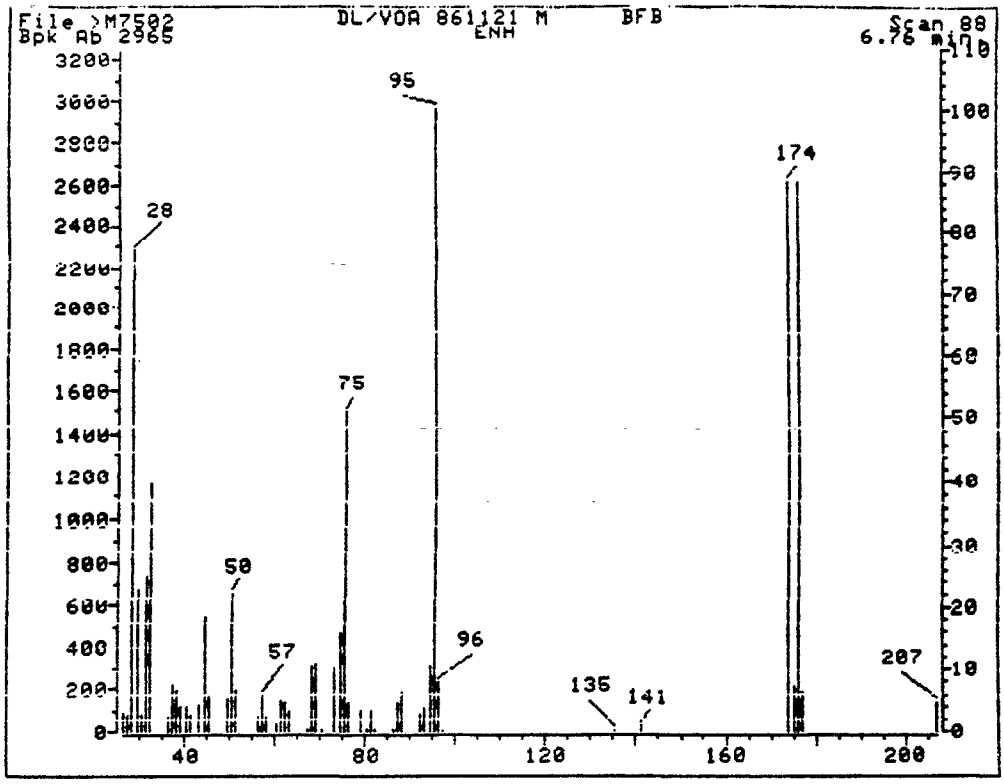

TABLE 2: METHOD PERFORMANCE DATA (QR21)

GC/MS Tuning Data - Bromofluorobenzene (BFB) for Volatiles Analysis

m/z	Ion Abundance Criteria	% Relative Abundance Base Peak	% Relative Abundance Appropriate Peak	Status
50	15-40% of mass 95	22.00	22.00	Ok
75	30-60% of mass 95	50.62	50.62	Ok
95	Base peak, 100% relative abundance	100.00	100.00	Ok
96	5-9% of mass 95	7.63	7.63	Ok
173	Less than 1% of mass 95	0.00	0.00	Ok
174	Greater than 50% of mass 95	88.52	88.52	Ok
175	5-9% of mass 174	7.03	7.95	Ok
176	95-101% of mass 174	88.43	99.89	Ok
177	5-9% of mass 176	6.31	7.13	Ok

Injection Date: 11/21/86
Injection Time: 09:32
Run No: >M7502
Spectrun No: 88

Analyst: [signature]
Processor: [illegible] Christopher [illegible]
QC Batch: QV5931
Samples: P4240, P4241, P4242, P4243, P4244, P4236, P4237, P4236, P4235, P5332, P5415, P5414, P4850, P4851, P4852

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Methodology
for
GC/MS Analysis of Priority Pollutant Compounds

The methods employed in the GC/MS analysis for priority pollutants are established EPA methods. Rigid compliance with the instrument parameters and performance criteria of the published methods was achieved. In some cases, the precise amounts of sample used and the sample handling procedures vary with the complexity of the sample matrix. Qualitative identification of the priority pollutants was performed using the relative retention times, the relative abundance of three characteristic ions and the abundance ratios. The entire mass spectrum was reviewed to confirm each identification. Quantitative analysis of detected compounds was performed by using a response factor generated by a major characteristic ion of the specific compound and an internal standard.

Compounds, in addition to those on the priority pollutant list, were identified through a computer-aided search of the NBS-EPA spectra library. After review the identifications are included in a separate tabulation and labelled "tentatively identified".

Volatile Priority Pollutant Compounds

For the analysis of Volatile priority pollutants, EPA Method 624 was used. The method can be summarized as follows: Helium is bubbled through a 5 ml water sample contained in a specially designed purging chamber at ambient temperature. The purgeable volatile organic compounds are transferred from the aqueous phase to the vapor phase. The vapor is swept through a sorbent column where the organic components are trapped. After the purge cycle is complete, the sorbent column is heated and backflushed with helium to desorb the organic purgeables onto a gas chromatographic column. The gas chromatograph is temperature programmed to separate the purgeable mixture. The separated purgeable components are then identified and quantitated using a computerized mass spectrometer.

Acid, Base/Neutral and Pesticide Priority Pollutant Compounds

For the analysis of the Acid, Base/Neutral and Pesticide priority pollutants in an aqueous liquid matrix, EPA Method 625 was used. The method can be summarized as follows: A measured volume of sample, approximately 1 liter, is adjusted to a pH greater than 11 and extracted with methylene chloride. The pH of the sample is adjusted to a value less than 2 and extracted with an aliquot of fresh methylene chloride. A separatory funnel or continuous extractor is used to perform the extractions. The two extracts are dried and concentrated to a 1 ml final volume. Each extract is injected into a GC/MS instrument specifically configured for the correct fraction.

Methodology for Analysis of Metals

AQUEOUS

The determination of metals in aqueous samples is performed according to the methods published by EPA in "Methods for Chemical Analysis of Water and Wastes," EPA-600/4-79-020, March, 1983, and the Federal Register, October 26, 1983. Arsenic, selenium and thallium are determined by furnace AA; silver, aluminum, barium, beryllium, boron, cadmium, calcium, chromium, copper, cobalt, iron, magnesium, manganese, molybdenum, nickel, lead, sodium, antimony, tin, titanium, vanadium, and zinc are determined by ICP emission spectrometry, except where lower levels of detection are required: in these cases (e.g. lead in groundwater monitoring samples) furnace AA is used. All furnace AA parameters are run by method of standard additions. The determination of mercury is performed by cold vapor AA.

EP TOXICITY

The determination of metals in aqueous EP Toxicity leachates is performed according to the methods published by EPA in "Test Methods for Evaluating Solid Waste" EPA SW-846, revised April, 1984 and the Federal Register, Oct. 26, 1983. 1979. Silver, arsenic, barium, cadmium, chromium, lead and selenium are determined by ICP emission spectrometry. Mercury is determined using cold vapor AA. For leachates that are organic in nature, the analyses are performed according to the methods described under ***OIL/SLUDGE*** below.

SOIL/SEDIMENT

The determination of silver, beryllium, cadmium, chromium, copper, nickel, antimony, lead, and zinc in sediment samples is performed according to methods published by EPA in "Interim Methods for the Sampling and Analysis of Priority Pollutants in Sediments and Fish Tissue", EPA 600/4-81-055, October 1980. Mercury is determined according to the sediment method published by EPA in "Method for Chemical Analysis of Water and Wastes", EPA 600/4-79-020, March 1983. Arsenic, selenium and thallium are determined by furnace AA using nitric acid in a closed decomposition vessel for sample digestion.

OIL/SLUDGE

The determination of silver, aluminum, boron, barium, beryllium, calcium, cadmium, copper, chromium, cobalt, iron, magnesium, manganese, molybdenum, sodium, nickel, lead, antimony, tin, titanium, vanadium, and zinc in sludge/petroleum-based samples is performed by ICP emission spectrometry using a magnesium nitrate dry ashing digestion technique. Arsenic, selenium and thallium are determined by furnace AA using nitric acid in a closed decomposition vessel for sample digestion. Mercury is determined by cold vapor AA using the same digestion technique.

Summary of Quality Assurance/Quality Control Procedures (QA/QC)

ETC bases its quality assurance protocols on the following government guidelines:

- "Handbook for Analytical Quality Control in Water and Wastewater Laboratories", EPA-600/4-79-019, March 1979;
- National Enforcement Investigation Center Policies, and Procedures manual; EPA-330/9/79/001-R, October 1979;
- the recommended guidelines for EPA Methods 624 and 625. (Federal Register, December 3, 1979, updated on October 26, 1984);
- "Manual of Analytical Methods for the Analysis of Pesticides in Humans and Environmental Samples," EPA 600/8-80-038, June 1980;
- "Determination of 2,3,7,8-TCDD in Soil and Sediment" EPA, Region VII, Kansas City, September 1983;
- Organic Analysis Multi-media, Multi Concentration-IFB WA84-A267; and
- Dioxin Analysis:Soil/Sediment Matrix; Multi-Concentration; Selected Ion Monitoring with Jar Extration Procedure-IFB WA84-A002

However, we have modified our protocols to provide a higher level of QA/QC than the guidelines require. For example, we analyze a higher than required number of quality control samples and we pay especially careful attention to the certification of the "reference standard" compounds we use in analysis. Below are listed the key QA/QC elements for the methods we used.

Analysis of Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry

- Each batch of 13 samples consists of 9 customer samples (at a maximun), one blank sample, one spiked blank, one spiked sample and one replicate sample. This amounts to a 30% quality control factor.
- Three surrogate compounds are added to each sample in the batch of 13.
- A blind quality control sample is introduced to the laboratory for analysis on a weekly basis.
- Each GC/MS is checked and retuned, if necessary, at the beginning of each day to ensure that its performance on bromofluorobenzene (BFB) meets the EPA criteria.
- A calibration curve for quantitation is prepared using a mixture of Volatile Organic Priority Pollutant "standards" at a minimum of 3 different concentrations and using a mixture of 3 internal standards at a constant concentration.
- The calibration curve is verified with a mixture of priority pollutant standards every day. If the response factors vary greater than 25%, the instrument must be recalibrated.

Analysis of Organic Compounds Extracted in Acid or Base/Neutral Solutions by Gas Chromatography/Mass Spectrometry

- Each batch of 20 samples consists of 16 customer samples (at a maximum), one blank sample, one spiked blank (for water matrices), one sample spiked with the priority pollutant standard mixture and a duplicate customer sample. This amounts to a 20% quality control factor.

- Three surrogate compounds are added to each sample in the batch for Base/Neutral analysis.
- Three surrogate compounds are added to each sample in the batch for Acid analysis.
- A blind quality control sample is introduced to the laboratory for analysis on a weekly basis.
- Each GC/MS is checked and retuned, if necessary, at the beginning of each day to ensure that its performance on decafluorotriphenylphosphine (DFTPP) meets the EPA criteria.
- A calibration curve for quantitation is prepared using a mixture of standards composed of either the Organic Acid or Base/Neutral Extractable Compounds at a minimum of 3 concentrations and using five internal standards for quantitation.

Analysis of Metals

All Samples

- New standards are prepared for each batch of samples
- Normal calibration is performed using a blank sample and four standards that have been through the sample preparation procedure. A regression analysis is used to construct the calibration curve.
- All EP Toxicity samples and all samples determined by furnace atomic absorption are calculated by the "method of additions".
- For each sample analysis that requires the use of the "method of additions" technique, a three point calibration is performed using U.S. EPA "Methods for Chemical Analysis of Water and Wastes, 1979". Results are obtained using linear regression analysis. Any regression with a coefficient of correlation below 0.990 is considered suspect, necessitating review of calibration data or sample re-analysis.
- In constructing the normal calibration curves the lowest concentration levels we use are values greater than or equal to 5 times the Instrumental Detection Limit (IDL).
- All calibration standards are analyzed in duplicate, at a minimum.
- Independent reference standards are used to check the accuracy of calibration standards.
- A check standard is analyzed every ten samples to validate the normal calibration curve.
- One customer sample out of every ten is analyzed in triplicate.

Homogeneous Samples (except for Mercury analysis)

Samples are analyzed in batches of 30 or less. For batches in which the sample matrices are homogeneous, the QC program is a minimum of 25% and consists of analyzing:

- 3 sets of triplicate analyses;
- 2 Replicate spikes;
- 1 Independent reference standard;
- 4 Calibration standards (processed using the sample preparation method);
- 4 Calibration standards (without sample preparation); and
- 1 Reagent Blank.

Heterogeneous Samples (except for Mercury analysis)

Samples are analyzed in batches of 30 or less. For batches in which the sample matrices are heterogeneous, the QC program is a minimum of 35% and consists of analyzing:

- 3 sets of triplicate analyses;
- 2 Replicate spikes;
- 1 Replicate independent reference standards;
- 4 Calibration standards (processed using the sample preparation method);
- 1 Procedural Blank;
- 4 Calibration standards (without sample preparation); and
- 1 Reagent Blank.

Analysis of Mercury

To analyze samples for mercury we group them by matrix in batches of 30 or less. Our QC program is a minimum of 30% and consists of analyzing:

- each of the 30 customer samples in duplicate;
- 3 sets of triplicate anaylses;
- 2 Replicate spikes;
- 2 Replicate independent reference standards;
- 10 Calibration standards (processed using the sample preparation method); and
- 2 Procedural Blanks.

Analysis of Pesticides, Herbicides and PCB's by Gas Chromatography

Pesticide, herbicide and PCB samples are grouped in batches of 16 customer samples or less according to the type of analysis to be performed. The QC program for each of these three types of analyses is a minimum of 20% and consists of analyzing:

- 1 procedural blank sample(a reagent blank is analyzed in the case of non-water matrices);
- 1 spiked blank sample (the spiked blank is eliminated in the case of non-water matrices);
- 1 replicate sample;
- 1 replicate spiked sample; and
- 1 known refernece QC sample for at least each 100 samples analyzed.

The instrument is calibrated each run with three standards, and checked every 10 samples.

Analysis of Cyanides, Phenols, Fluoride, Chloride, Nitrate and Nitrite

- All parameters are analyzed using a Technicon Autoanalyzer II GT.
- 3 calibration standards are analyzed at the beginning and end of each batch.

- Each batch (up to 80 samples) consists of analyzing one blank, one spiked blank, one duplicate and spiked sample every 20 samples, and an EPA known reference sample.

Analysis of Total Organic Carbon (TOC)

TOC samples are analyzed on a daily basis with the number of samples analyzed per day dependent on the request for duplicate or quadruplicate analyses. The quality control program is designed to maintain the appropriate amount of QC and consists of the following elements:

- Daily instrument calibration
- One blank
- Standard recalibration every 10 samples
- Spiked samples at a low and high level
- Every sample is run in duplicate at a minimum

Analysis of Total Organic Halide (TOX)

- Blank reagent water for absolute carbon background must contain less than 5 ug/l of halide (as chloride).
- Using a trichlorophenol standard, the mean adsorption efficiency must be within +/- 15% of the standard value.
- Calibration standards are run every 10 samples.
- Every sample is run in duplicate at a minimum.

Analysis of 2,3,7,8-TCDD (Dioxin) by GC/MS (SIM)

- Each sample is dosed with a known quantity of $^{13}C_{12}$-2,3,7,8-TCDD as internal standard and $^{37}Cl_4$-TCDD as surogate standard. The action limits for surrogate standard results is +/- 40% of the true value. Samples showing surrogate standard results outside of these limits are reextracted and reanalyzed.
- Two laboratory "method blanks" are run along with each set of 24 or fewer samples. The method blank is also dosed with the internal standard and surrrogate standard
- At least one per set of 24 samples is run in duplicate to determine intralaboratory precision.
- Qualitative Requirements. The following are met in order to confirm the presence of native 2,3,7,8-TCDD:

  a. Isomer specificity must be demonstrated initially and verified once per 8-hour work shift. The verification consists of injecting a mixture containing TCDD isomers which elute close to 2,3,7,8-TCDD. The 2,3,7,8-TCDD must be separated from interferring isomers, with no more than 25% valley relative to the 2,3,7,8-TCDD peak.

  b. The 320/322 ratio is within the range of 0.67 to 0.87.

  c. Ions 320, 322, and 257 are all present and maximize together the signal to mean noise ratio must be 2.5 to 1 or better for all 3 ions.

  d. The retention time is equal (within 3 seconds) the retention time for the isotopically labeled 2,3,7,8-TCDD.

  e. At least one of the positives can be confirmed by obtaining partial scan spectra from mass 150 to mass 350. The partial scan guidelines are as follows:

. the 320/324 ratio should be 1.58 +/- 0.16

. the 257/259 ratio should be 1.03 +/- 0.10

. the 194/196 ratio should be 1.54 +/- 0.15

- One sample is spiked with native 2,3,7,8-TCDD at a level of 1.0 PPB (for soil) for each set of 24 or fewer samples.
- In cases where no native 2,3,7,8-TCDD is detected, the actual detection limit is estimated and reported based on a signal to noise ratio of 2.5 to 1 at ions 320 and 322.
- For each sample, the internal standard is present with at least a 10 to 1 signal to noise ratio for both mass 332 and mass 334. Also, the internal standard 332/334 ratio must be within the range of 0.67 to 0.87.

Subcontractor QA/QC

Each subcontractoer is required to maintain an appropriate level of quality control. To insure this, each subcontractor is required to submit to ETC the quality control data for all analyses it performs. This data is kept on file at ETC. In general, the amount of quality control required is one duplicate sample with one spiked sample for every ten analyses.

Chain-of-Custody

The chain-of-custody procedure is part of our quality assurance protocol. We believe our chain-of-custody record fully complies with the legal requirements of federal, state and local government agencies and of the courts of law. The record covers:

- labeling of sample bottles, packing the Sample Shuttle and transferring the Shuttle under seal to the custody of a shipper;
- outgoing shipping manifests;
- the chain-of-custody form completed by the person(s) breaking the Shuttle seal, taking the sample, resealing the Shuttle and transferring custody to a shipper;
- incoming shipping manifests;
- breaking the Shuttle's reseal;
- storing each labeled sample bottle in a secured area;
- disposition of each sample to an analyst or technician; and
- the use of the sample in each bottle in a testing procedure appropriate to the intended purpose of the sample.

The records show for each link in this process:

- the person with custody; and
- the time and date each person accepted or relinquished custody.

Appendix A

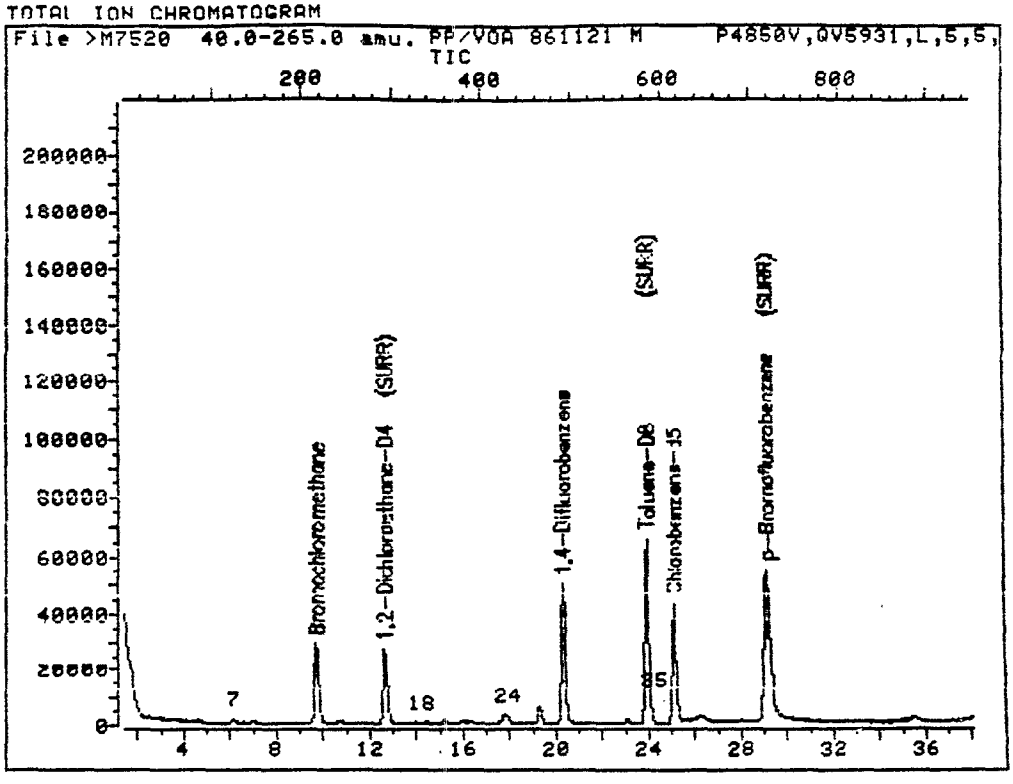
Mass Spectral Data for Quantitated Compounds

1) A total ion chromatogram for each sample analyzed by a GC/MS instrument.

2) A Quant. report used by the analyst to determine qualitative and quantitative results of the compounds present.

3) A mass spectrum and a reference spectrum for each priority pollutant compound detected in the sample.

TOTAL ION CHROMATOGRAM



Data File: >M7520::U4 Quant Output File: ^M7520::AQ
Name: PP/VOA 861121 M
Misc: P4850V,QV5931,L,5,5,

Id File: MVOA::US
Title: Volatile Priority Pollutant ID FILE
Last Calibration: 861121 12:01

Operator ID: DG1199
Quant Time: 861122 04:05
Injected at: 861122 03:26

QUANT REPORT

Operator ID: DG1199 Quant Rev: 6 Quant Time: 861122 04:09
Output File: ^M7520::AQ Injected at: 861122 03:26
Data File: >M7520::U4 Dilution Factor: 1.00000
Name: PP/VOA 861121 M
Misc: P4850V,QV5931,L,5,5,

ID File: MVOA::US
Title: Volatile Priority Pollutant ID FILE
Last Calibration: 861121 12:01

	Compound		R.T.	Scan#	Area	Conc	Units	q
1)	*Bromochloromethane		9.73	216	61033	250.00	NG	98
~~7)~~	~~Methylene chloride~~		~~6.13~~	~~123~~	~~3022~~	~~22.80~~	~~NG~~	~~96~~
16)	*1,4-Difluorobenzene		20.34	490	225753	250.00	NG	81
17)	1,2-Dichloroethane-D4	(SURR)	12.67	292	53629	269.48	NG	94
~~18)~~	~~1,1,1-Trichloroethane~~		~~14.83~~	~~327~~	~~1214~~	~~2.95~~	~~NG~~	~~98~~
~~24)~~	~~Benzene~~		~~17.78~~	~~424~~	~~8248~~	~~9.87~~	~~NG~~	~~89~~
30)	*Chlorobenzene-d5		25.14	614	152293	250.00	NG	95
34)	Toluene-D8	(SURR)	23.98	584	275620	249.60	NG	94
~~35)~~	~~Toluene~~		~~24.13~~	~~588~~	~~3027~~	~~2.78~~	~~NG~~	~~91~~
38)	p-Bromofluorobenzene	(SURR)	29.17	718	163579	258.87	NG	98

* Compound is ISTD

snc 11/24/86

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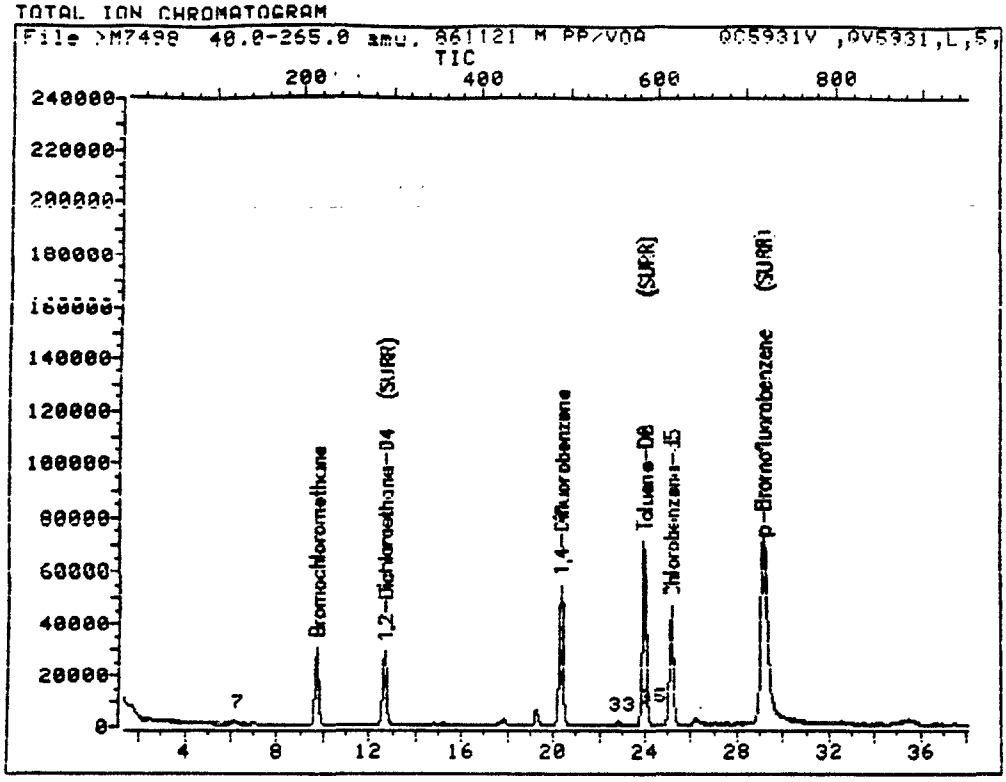
Appendix C1
GC/MS Subsidiary Data

TOTAL ION CHROMATOGRAM



Data File: >M7498::U3 Quant Output File: ^M7498::AW
Name: 861121 M PP/VOA
Misc: QC5931V ,QV5931,L,5,5,

Id File: MVOA::US
Title: Volatile Priority Pollutant ID FILE
Last Calibration: 861121 12:01

Operator ID: JQ6275
Quant Time: 861121 12:03
Injected at: 861121 06:18

QUANT REPORT

Operator ID: JW6275 Quant Rev: 6 Quant Time: 861121 12:03
Output File: ^M/498::AQ Injected at: 861121 06:18
Data File: >M/498::U3 Dilution Factor: 1.00000
Name: 861121 M PP/VOA
Misc: QC5931V ,WV5931,L,5,5,

ID File: MVOA::US
Title: Volatile Priority Pollutant ID FILE
Last Calibration: 861121 12:01

	Compound		R.T.	Scan#	Area	Conc	Units	q
1)	*Bromochloromethane		9.70	217	66376	250.00	NG	99
7)	Methylene chloride		6.18	126	2829	19.63	NG	86
16)	*1,4-Difluorobenzene		20.31	491	249275	250.00	NG	82
17)	1,2-Dichloroethane-D4	(SURR)	12.65	293	57076	259.74	NG	94
30)	*Chlorobenzene-d5		25.11	615	170859	250.00	NG	99
~~33)~~	~~Tetrachloroethylene~~		~~22.83~~	~~556~~	~~2829~~	~~6.08~~	~~NG~~	~~94~~
34)	Toluene-D8	(SURR)	23.95	585	307632	248.31	NG	91
~~35)~~	~~Toluene~~		~~24.15~~	~~590~~	~~1931~~	~~1.58~~	~~NG~~	~~92~~
38)	p-Bromofluorobenzene	(SURR)	29.10	718	181687	256.29	NG	97

* Compound is ISTD

SMC 11/24/86

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Appendix D
Subcontractor's Data

1) A copy of the originating subcontractor's report is included for all data not generated within ETC's laboratory.

ETC ENVIRONMENTAL TESTING and CERTIFICATION

Subcontracted Analytical Results

RE

ETC Job # P148150

Lab ID: L801272-G1

Submitted by: SN/CHUN

Date: 11-21-86

Facility: ____________ (Facility Code)

Sample Point: __ — ____________ (Source Code — Sample Point ID)

Date Sampled: __ __ __ __ __ __ (Y Y M M D D)

Time Sampled: __ __ : __ __ (H H M M)

Line No.	Parameter	Table	Units Of Measure	Value	MDL	Comments
CONVENTIONALS						
1	Chloride	QR 10	mg/l			
2	Fluoride	QR 10	mg/l			
3	Nitrate as N	QR 10	mg/l			
4	Sulfate as SO4	QR 10	mg/l	85	2	
5	Phenolics, Total	QR 10	mg/l			
6	Total Organic Halides (TOX)	QR 10	ug/l			
	Total Organic Halides (TOX)	QR 10	ug/l			
	Total Organic Halides (TOX)	QR 10	ug/l			
	Total Organic Halides (TOX)	QR 10	ug/l			
7	Total Organic Carbon	QR 10	mg/l			
	Total Organic Carbon	QR 10	mg/l			
	Total Organic Carbon	QR 10	mg/l			
	Total Organic Carbon	QR 10	mg/l			
8	Specific Conductance (Lab)	QR 10	um/cm			
	Specific Conductance (Lab)	QR 10	um/cm			
	Specific Conductance (Lab)	QR 10	um/cm			
	Specific Conductance (Lab)	QR 10	um/cm			
9	pH (Lab)	QR 10	std			
	pH (Lab)	QR 10	std			
	pH (Lab)	QR 10	std			
	pH (Lab)	QR 10	std			
10	Coliform, Total	QR 10	C/100			
11	Coliform, Fecal	QR 10	C/100			
12	Gross Alpha	QR 10	PCi/l			
13	Gross Beta	QR 10	pCi/l			
14	Acidity as CaCO3		mg/l			
15	Alkalinity as CaCO3		mg/l			
16	Ammonia as N		mg/l			
17	Bicarbonate as CaCO3		mg/l			
18	Biochemical Oxygen Demand		mg/l			
19	Carbonate as CaCO3		mg/l			
20	Chemical Oxygen Demand		mg/l			
21	Color, Apparent (Lab)		Pt/Co			
22	Cyanide, Total		mg/l			
23	Hardness as CaCO3		mg/l			
24	Nitrite as N		mg/l			
25	Nitrogen Total Kjeldahl (TKN)		mg/l			
26	Nitrogen, Total Organic		mg/l			
27	Odor (Lab)		TON			
28	Oil and Grease (grav, IR)		mg/l			
29	Phosphate, ortho		mg/l			
30	Phosphate, Total		mg/l			
31	Solids, Total		mg/l			
32	Solids, Total Dissolved (ROE) 180°		mg/l			
33	Solids, Total Suspended		mg/l	490	2	
34	Sulfide as S		mg/l			
35	Surfactants (MBAS/LAS)		mg/l			
36	Turbidity (Lab)		NTU			

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Appendix E

Chain-of Custody Forms

1) A field Chain-of-Custody form (COC) is included for all samples shipped by ETC shuttle.

2) An in-house sample Chain-of Custody form is included for all samples not shipped by ETC shuttle.

3) Any additional Chain-of-Custody material provided by a client or by a client's sampling agent is also included.

4) A subcontractor's Chain-of-Custody form is included for any analytical work not performed within ETC's laboratory.

5) Analysis and Extraction Custody forms are included for the period the sample was in ETC's possession.

ETC ENVIRONMENTAL TESTING and CERTIFICATION

CHAIN OF CUSTODY FORM (CC1)

ORIGINAL

Seal No. 67753 ETC Job # P4850

Date Sealed 6 NOV. 1986 By: M. I.

Company: HELLERTOWN MANUFACTURING Attn.: MARK SCHULTZ

Facility/Site: C/O GUARD OFFICE-SILVER ROAD Phone:

Address: HELLERTOWN, PA. 18055

SAMPLE IDENTIFICATION

Facility: CHAMPION (Facility/Site Code) (Optional Sample Point Descriptions)

Sample Point: W-CSP-1 (Source Code (from below); Your Sample Point ID (left justify)) 11 10 86 (Start Date (YY/MM/DD)) 1100 (Start Time (2400 hr clock)) (Elapsed Hours (composite))

86/11/10 MB 86/11/13

Source Codes.

Well ..(W) Outfall.....(O) Bottom Sediment ....(B) Surface Impoundment....(I) Leachate Collection Sys.....(C) Other ..... (X)

Soil ..(S) River/Stream ..(R) Generation Point ...(G) Treatment Facility .....(T) Lake/Ocean .....(L) Specify

SHUTTLE CONTENTS

BOTTLE No	Type	Size	Preserv.	ANALYSIS	SAMPLER Filt. (Y/N)	SAMPLER Observations	LAB Observations
1	M	500 ML	HN03	METALS			✓
1	PN	125 ML	H2S04	PHENOLS			VERY LOW SAMPLE VOLUME
1	B	125 ML	H2S04	NITRATE			✓
1	CN	125 ML	NAOH	CYANIDE			✓
1	A	500 ML	BAKED	SOLIDS, TD/SULFATE			✓
1	D	500 ML	DI RINSE	FLUORIDE			✓
2	V	40 ML	SOD. THIOL.	VOA			✓
1	TB	40 ML	GC/MS H20	TRIP BLANK			✓

CHAIN OF CUSTODY CHRONICLE

1. Shuttle Opened By: (print) M. SCHULTZ Date: 11-10-86 Time:
   Signature: Seal #: Intact: ✓

2. I have received these materials in good condition from the above person.
   Name: Signature:
   Date: Time: Remarks:

3. I have received these materials in good condition from the above person.
   Name: Signature:
   Date: Time: Remarks:

4. Shuttle Sealed By: (print) M. SCHULTZ Date: 11-10-86 Time: 16:30
   Signature: Seal #: 67754 Intact:

LAB USE ONLY Opened By: Izak Schtadt Date: 11/11/86 Time: 5:22 PM

SHUTTLE # 381 TEMP. °C 12 SEAL # 67754 COND. INTACT

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ETC ENVIRONMENTAL TESTING and CERTIFICATION

FIELD PARAMETER FORM (CC2)

ETC JOB # P4850

Sample Point [WI] [CISP-1] (Source Code / Sample Point I.D)

FIELD PROCEDURES

PURGE DATE (YY MM DD)	START PURGE (2400 Hr Clock)	ELAPSED HRS	WATER VOL. IN CASING (Gallons)	VOLUME PURGED (Gallons)

SAMPLING METHOD: _____

Sampler Type [ ] A-Submersible Pump, B-ISCO, C-Bladder Pump, D-Dipper/Bottle, E-Bailer, F-Scoop/Shovel, X-Other _____ (SPECIFY OTHER)

Sampler Material [ ] A-Teflon, B-Metal, C-PVC, D-Plastic, X-Other _____ (SPECIFY OTHER)

Tubing Material [ ] A-Teflon, B-Tygon, C-Polyethylene, D-Silicon, X-Other _____ (SPECIFY OTHER)

Sample Composited [Y/N] _____ Procedure/Proportions

FIELD MEASUREMENTS

Well Elevation (ft/msl) _____ Well Depth (ft) _____

Depth to Ground water (ft) _____ Sample Depth (non-well) (ft) _____

Groundwater Elevation (ft msl) _____

	ph	(STD)	spec. cond.	um/cm at 25° C	(other parameter)	value	units
1st		(STD)		um/cm at 25° C			
2nd		(STD)		um/cm at 25°C			
3rd		(STD)		um/cm at 25°C			
4th		(STD)		um/cm at 25°C			

Sample Temp _____ (°C) Turbidity _____ NTU

FIELD COMMENTS

Sample Appearance: _____

Weather Conditions: _____

Other: _____

FILTERING: Use Chain of Custody (CC1) to indicate which bottles were filtered

Sampler: _____ (Print) Employer: _____

I certify that sampling procedures were in accordance with applicable EPA state and corporate protocols.

_____ (Date) _____ (Signature)

ORIGINAL

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ETC ENVIRONMENTAL TESTING and CERTIFICATION

LABORATORY CHRONICLE: GC-MS Department

DATE 861121 SHIFT ______
FRACTION VOA
INSTRUMENT M
TUNE FILE APETO2
SEQUENCE FILE JQM
METHOD FILE VOAM
ID FILE MVOA
ANALYST(S) [signatures]
SUPERVISOR [signature]
BATCH #'s QV5931

(PLEASE INITIAL)

CURRENT CS05 STATUS		STANDARDS UPDATED	
ACQ		DATE	861126
WIP		BY	[signature]

STANDARD	CONC PPM	LOT NO.	LOT VOL
p-BFB	50	13795	1
Internal Std E	25	13747	10
Surrogate	25	14671	10
ABC/XVOA	18	14664A	5,10,30

NAME	DATA FILE	uL INJ	ALS #	DIL	TAPE #	SPECIALS (WRITE A-TYPE)	PLUS Y/N
p-BFB	>M7497	1ul					
QC5931V	>M7498	5ml	1			06:18	
QC5931VS	>M7499	↓	2		CBUPD	5ul ABC/XVOA	
QC5931VS	>M7500		3		CBCAL	10ul ABC/XVOA	
QC5931VS	>M7501	↓	4			30ul ABC/XVOA 08:45	
p-BFB	>M7502	1ul			OK	09:32	
P4240VS	>M7503	5ml	1		OK		
P4240V	>M7504		2		OK		
P4241VR	>M7505		3		OK		
P4241V	>M7506	↓	4		OK		
P4242V	>M7507	5ml	5		OK		
P4243V	>M7508		6		OK		
P4244V	>M7509		7		OK		
P4236V	>M7510		8		OK		
P4237V	>M7511	↓	9		OK		
② P4239V	>M7512	0.001	10	1:5000		Too Dilute Rerun 1:500	
p-BFB	>M7513	1ul					
QC5931VS	>M7514		10		OK	5ul ABC/XVOA	
② P4239V	>M7515	0.01	1	1:500	OK	For Benzene	
P4235V	>M7516	5ml	2		OK		
P5336V	>M7517		3		OK		
P5415V	>M7518	↓	4		OK		
P5414V	>M7519	0.1ml	5	1:50	OK		
P4850V	>M7520	5ml	6		OK		
P4851V	>M7521	↓	7		OK		

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ETC FORM #102

ETC ENVIRONMENTAL TESTING and CERTIFICATION

LABORATORY CHRONICLE: GC-MS Department

DATE 861122 SHIFT
FRACTION VOA
INSTRUMENT am
TUNE FILE APE102
SEQUENCE FILE 1am
METHOD FILE VOAM
ID FILE MVOA
ANALYST(S) J. Quinn
SUPERVISOR [illegible]
BATCH #'s QV5931

(PLEASE INITIAL)

CURRENT CS05 STATUS		STANDARDS UPDATED	
ACQ		DATE	
WIP		BY	

STANDARD	CONC PPM	LOT NO.	LOT VOL.
PAGE 2 of 2			

NAME	DATA FILE	uL INJ	ALS #	DIL	TAPE #	SPECIALS (WRITE A-TYPE)	PLUS Y/N
P4852V	>m7522	5ml	8		OK		
P4853V	>m7523	↓	9		NG	rerun carryover	
			~~10~~				

ETC FORM #102

SUBCONTRACT
REQUEST FOR ANALYSIS
and SAMPLE CHAIN OF CUSTODY

LOGLINK: 17866

MATRIX: WATER

NAME OF SUBCONTRACT LAB: CHYUN

ETC JOB NUMBERS: P4850 P4853
P4851
P4852

TURNAROUND IN DAYS: NORMAL DATE DATA REQUIRED: 11/22
(If deadline cannot be met, contact ETC Subcontract Group).

Send invoice, bill and reports to : ETC Subcontract Group
(201)225-6786

Please perform the analyses requested below:

___ Acidity	___ Alkalinity	___ Ammonia(probe)
___ Ammonia(dist)	___ Bicarbonate	___ BOD(5 day)
___ Bromide	___ Carbonate	___ Chloride
___ Chem.Oxygen Dem.	___ Chromium+6	___ Fecal Coliform
___ Total Coliform	___ Color,apparent	___ Cyanide,total
___ Fluoride	___ Formaldehyde(UV)	___ Hardness
___ Nitrate(NO3)	___ Nitrite(NO2)	___ TKN
___ Odor	___ Oil & Grease(grav)	___ T.Organic Carb.
___ Pet.Hydro(IR)	___ Pet.Hydro(grav)	___ Phenolics,tot.
___ Phenolics(5ug/l)	___ Phosphate(ortho)	___ Phospate(total)
___ Phosphorus(tot.)	___ Silica(dissolved)	X Sulfate(SO4)
___ Sulfide(S)	___ Sulfite(SO3)	___ Surfactant(MBAS
___ Solids,Total	___ Solids,Tot. Diss.	___ Solids,Tot.Set.
X Solids,Tot. Sus.	___ Solids,Tot. Vol.	___ Turbidity
___ Gross Alpha,Beta	___ Radium 226	___ Radium 228

Others: _____

Chain of Custody Section for Courier Pick up at ETC

Sample(s) Relinquished by:(ETC) Mark Lichtadt
Time: 4:30pm Date: 11/5/86

Sample(s) Received by: Mark Kelly
Time: 4:30pm Date: 11/12/86

Chain of Custody Section for Sending Sample from ETC

Sample Shuttle sealed by : _____
Date: ___/___/___ Time: _____ Seal Number: _____

Sample Shuttle opened by : _____
Date: ___/___/___ Time: _____ Seal Number: _____
Was the Seal intact? _____ Are the shuttle contents in good condition? _____

Chain of Custody Section for Returning Sample to ETC

Sample Shuttle sealed by: _____
Date: ___/___/___ Time: _____ Seal Number: _____

Sample Shuttle opened by : _____
Date: ___/___/___ Time: _____ Seal Number: _____
Was the Seal intact? _____ Are the shuttle contents in good condition? _____

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ETC ENVIRONMENTAL TESTING and CERTIFICATION

CONVENTIONAL CHEMISTRY LAB

ANALYZED ON: 11/26/86

TEST: Fluoride, UNITS: mg/L,
METH. REF. # STD METHOD 413E, MDL: 0.10,
INSTRUMENT # A.A. Channel 7,

BY: Cyberman
BOOK # CV-12 P. 108
FROM PAGE # 107

Lg Lnk	Job #	ANALYZED CONC.	Dilu	REPORTED CONC.	Lg Lnk	Job #	ANALYZED CONC.	Dilu	REPORTED CONC.
17455	M0831	0.07	-	BmDL	17828	P2472	0.03	-	BmDL
17455	M0703	0.26	10x	2.60	17828	P2473	0.03	-	BmDL
17455	M0704	0.27	10x	2.70	17828	P2522	0.08	-	BmDL
17455	M0705	0.23	10x	2.30	17828	P2536	0.03	-	BmDL
17455	M0706	0.28	10x	2.80	17828	P2548	0.02	-	BmDL
17455	M0707	0.23	10x	2.30	17866	P4850	0.16	-	0.16
17455	M0708	.003	-	BmDL	17866	P4851	0.21	-	0.21
17514	~~P4832~~ FLQ032	0.44	-	0.44	17866	P4852	2.24	-	RPT
17514	~~P4833~~ FLQ033	0.54	-	0.54	17866	P4853	0.98	-	0.98
17749	P2500	0.01	-	BmDL	17250	M4520	1.64	-	1.64
17749	P2513	0.07	-	BmDL	17441	P2237	0.07	-	BmDL
17749	P2514	0.03	-	BmDL	17878	P2776	0.087	-	BmDL
17749	P2515	0.07	-	BmDL	17864	P2481	.006	-	BmDL
17749	P2526	0.04	-	BmDL	17864	P2531	0.02	-	BmDL
17778	P2497	0.03	-	BmDL	17864	P2541	0.04	-	BmDL
17778	P2499	0.03	-	BmDL	17864	P2546	0.02	-	BmDL
17778	P2507	0.13	-	0.13	17864	P2554	0.01	-	BmDL
17778	P2517	0.12	-	0.12					
17798	P2469	0.03	-	BmDL					
17798	P2477	0.05	-	BmDL					
17798	P2524	0.08	-	BmDL					
17798	P2538	0.05	-	BmDL					
17798	P2539	0.04	-	BmDL					
17798	P2540	0.02	-	BmDL					

STANDARDS

PREPED ON _____
BY _____
FROM _____ mg/L
STOCK # _____

STANDARD mg/L	VALUE OBTAINED	% of Standard

SLOPE	Intercept	Corr. Coef.

ADDITIONAL COMMENTS

RPT: LNG219 - {over 2 mg/l
P4852 - {and excessive instrument noise
Dilute 1:10 and check

Analyses QA/QC Data Report

See CV-12, P 107.

QC Batch # FL001 + FL003

Verified: [signature] 11/28/86

METHOD BLANK	
Spiked Blank (Known)	
Spiked Blank Result	
% Recovery	
EXTERNAL REF. QC	
Known Value	
Observed Result	
% Recovery	

PRECISION

Job # Dup (ETC)	P2472
Original Result	.0297
Duplicate Result	.0339
R Range	.0042

ACCURACY

Job # Spiked (ETC)	P2472
Original Result	.0313
Amount Spiked	1.00
Spiked S' Result	1.07
% Recovery	104 %

To Page No. _____

ETC ENVIRONMENTAL TESTING and CERTIFICATION

CONVENTIONAL CHEMISTRY LAB

ANALYZED ON: 11-21-86

TEST: NITRATE, UNITS: mg/l,

METH. REF. #: 353.2, MDL: 0.10, x7

INSTRUMENT #: #1 (Channel 1),

BY: CH

BOOK # CV-12 P. 97

FROM PAGE #: 96

Lg Lnk	Job #	ANALYZED CONC.	Dilu	REPORTED CONC.
7514	N6032	.334	5X	1.67
7514	N6033	.0134	5X	Redo
7562	N6122	.804	5X	4.02
7503	P2683	.0213	5X	Redo
7798	P2469	.276	10X	2.76
7798	P2477	1.54	10X	15.4
17798	P2524	.517	10X	5.17
17798	P2538	.583	10X	5.83
7796	P2539	.856	10X	8.56
7798	P2540	.618	10X	6.18
~~7814~~	~~P2555~~	~~.101~~	~~10X~~	
17822	P3107	.417	10X	4.17
~~7822~~	~~P3112~~	~~.0139~~	~~10X~~	
17828	P2473	.442	10X	4.42
17828	P2472	.547	10X	5.47
17828	P2522	.417	10X	4.17
7828	P2536	.435	10X	4.35
7828	P2548	.525	10X	5.25
~~7864~~	~~P2481~~	~~.0142~~	~~10X~~	
~~7864~~	~~P2521~~	~~.0154~~	~~10X~~	
~~7864~~	~~P2541~~	~~.160~~	~~10X~~	~~1.60~~
17864	P2546	.694	10X	6.94
~~17864~~	~~P2554~~	~~.196~~	~~10X~~	~~1.96~~
17866	P4850	.550	10X	5.50

Lg Lnk	Zone #	ANALYZED CONC	Dilu	REPORTED CONC
17866	P4851	.793	10X	7.93
~~17866~~	~~P4852~~	~~.0427~~	~~10X~~	
17866	P4853	.442	10X	4.42
~~17866~~	~~P4854~~	~~.0142~~	~~10X~~	
~~17866~~	~~P3117~~	~~.153~~	~~10X~~	~~1.53~~
~~17866~~	~~P3120~~	~~.0134~~	~~10X~~	
~~17866~~	~~P3123~~	~~.0211~~	~~10X~~	
~~17866~~	~~P3124~~	~~.0229~~	~~10X~~	
~~17866~~	~~P3126~~	~~.0176~~	~~10X~~	
17882	P2543	.528	10X	5.28
~~17882~~	~~P2544~~	~~.0853~~	~~10X~~	
17882	P2545	1.33	10X	13.3
17882	P2547	1.44	10X	14.4
17882	P2549	.924	10X	9.24
17882	P2550	.401	10X	4.01
17882	P2551	1.03	10X	10.3
17882	P2552	.717	10X	7.17

STANDARDS

PREPD ON _____

BY _____

FROM _____ mg/L

STOCK# _____

STANDARD mg/L	VALUE OBTAINED	% of Theoretical

SLOPE	Intercept	Corr. Coef.

ADDITIONAL COMMENTS

Straight Red Line Through Samples Done on Channel 2 no dilution Page 98

Ref N6033 } straight
P2683 }

Analyses QA/QC Data Report

QC Batch # N3003 & N3004

Verified: 11/24/86

METHOD BLANK			PRECISION							
			Job # Dup (ETC)							
			Original Result							
Spiked Blank (Known)			Duplicate Result							
Spiked Blank Result			R Range							
% Recovery			ACCURACY							
			Job # Spiked (ETC)							
EXTERNAL REF. QC			Original Result							
Known Value			Amount Spiked							
Observed Result			Spiked S' Result							
% Recovery			% Recovery							

To Page No. _____

ETC ENVIRONMENTAL TESTING and CERTIFICATION

CONVENTIONAL CHEMISTRY LAB

Analyzed on: 11-28-86

TEST: NITRATE, UNITS: mg/l,

METH. REF. #: 353.2, MDL: 0.10, 37

INSTRUMENT #: #1 (Channel 2),

BY: CM

BOOK # CV-12 P. 98

FROM PAGE #: ____

LogLink	Job #	ANALYZED CONC.	Dilu	REPORTED CONC.	LogLink	Job #	ANALYZED CONC	Dilu	REPORTED CONC
.7798	P2469	over		*	17886	P3117	1.15		1.15
.7798	P2471	over		*	17886	P3120	.0207		BmDL
.7798	P2524	over		*	17886	P3122	.0511		BmDL
.7798	P2538	over		*	17886	P3124	.0173		BmDL
.7798	P2539	over		*	17886	P3126	.0127		BmDL
.7798	P2540	over		*	17882	P2543	over		*
.7814	P3555	.487	-	.49	17882	P2544	.0250		BmDL
.7822	P3107	over		*	17882	P2545	over		*
17822	P3112	.007		BmDL	17882	P2547	over		*
17828	P2473	over		*	17882	P2549	over		*
.7828	P2472	over		*	17882	P2550	over		*
17828	P2522	over		*	17882	P2551	over		*
17828	P2536	over		*	17882	P2552	over		*
17828	P2537	over		*					
17864	P2481	.006		BmDL					
17864	P2531	.0245		BmDL					
17864	P2541	1.73		1.73					
17864	P2546	over		*					
17864	P2554	2.06		2.06					
17866	P4850	over		*					
17866	P4851	over		*					
7866	P4852	.398		.40					
7866	P4853	over		*					
7878	P2770	.0462		BmDL					

STANDARDS

PREPD ON ____

BY ____

FROM ____ mg/L

STOCK# ____

STANDARD mg/L	VALUE OBTAINED	% of Theoretical
2.00	1.98	
1.00	1.04	
.50	.497	
.80	.0934	

SLOPE	Intercept	Corr. Coef.

ADDITIONAL COMMENTS

* RPS on CHannel 1

Complete Page 97

Analyses QA/QC Data Report

QC Batch # NC003

Verified: 11/24/86

PRECISION

METHOD BLANK	.003	.0177
Spiked Blank (Known)	.5	.5
Spiked Blank Result	.501	.532
% Recovery	160%	1.06
EXTERNAL REF. QC	EPA	
Known Value	93	
Observed Result	.953	
% Recovery	1.02	

Job # Dup (ETC)	P2473	P4850	P3126
Original Result	over	over	.0217
Duplicate Result	↓	↓	.0194
R Range	↓	↓	
ACCURACY			
Job # Spiked (ETC)	P2473	P4850	P3126
Original Result	over	over	.021
Amount Spiked		↓	.5
Spiked $ Result	↓		.506
% Recovery			97%

To Page No. ____

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ETC ENVIRONMENTAL TESTING and CERTIFICATION

CONVENTIONAL CHEMISTRY LAB

TEST: Nitrite, UNITS: mg/l, ANALYZED ON: 11-22-86

METH. REF. # 353.2, MDL: 0.10, BY: S.T.

INSTRUMENT # #1 (Channel 2), BOOK # CV-12 P. 100

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Log Lik	Job #	ANALYZED CONC.	Dilut	REPORTED CONC.
7524	N6110	0		BMDL
7529	N6120	.0028		BMDL
7529	N6126	.0040		BMDL
7531	P2710	.0024		BMDL
17531	P2725	0		BMDL
7539	P2117	.0043		BMDL
7539	P2116	.0954		BMDL
17539	P2119	.0571		BMDL
7524	P1711	.0043		BMDL
17524	P1713	.0040		BMDL
7524	P1714	0		BMDL
7524	P1717	00119		BMDL
17562	N6128	0		BMDL
17562	N6148	.00119		BMDL
7573	P2717	0		BMDL
17579	P2726	.118		.12
17587	P3068	.100		.10
17503	P2683	.121		.12
17562	N6122	.00357		BMDL
7524	P1715	.00213		BMDL
17864	P2531	.00119		BMDL
17864	P2541	.0611		BMDL
17864	P2546	.0691		BMDL
17864	P2557	.00238		BMDL

Log Lik	Job #	ANALYZED CONC	Dilu	REPORTED CONC
17866	P4850	.00151		BMDL
17866	P4851	.0166		BMDL
17866	P4852	.0490		BMDL
17866	P4853	.0446		BMDL
17878	P2774	.00181		BMDL
17866	P3120	.00114		BMDL
17866	P3122	0		BMDL
17866	P3124	.0164		BMDL
17866	P3126	0		BMDL
17882	P2543	.00471		BMDL
17882	P2544	.00213		BMDL
17882	P2545	.00473		BMDL
17882	P2547	.00784		BMDL
17882	P2549	.00119		BMDL
17886	P3117	.0066		BMDL

STANDARDS

PREPED ON ____

BY ____

FROM ____ mg/L

STOCK# ____

STANDARD mg/L	VALUE OBTAINED	% of Theoretical
1.00	.99	99 %
0.50	.51	102 %
0.20	.197	98.5 %
0.05	.046	92%

SLOPE	Intercept	Corr. Coef.
.0120	-.0005	.9998

ADDITIONAL COMMENTS

ALL Calculations By X=mY+B.

Analyses QA/QC Data Report

QC Batch # (W3004 NO2)

Verified: 11/24/86

PRECISION

METHOD BLANK	.00837	
Spiked Blank (Known)	.20	
Spiked Blank Result	.198	
% Recovery	99	
EXTERNAL REF. QC	N/A	DS
Known Value		.5
Observed Result		-5.32
% Recovery		

Job # Dup (ETC)	N6110	P1714					
Original Result	0	0					
Duplicate Result	0	.0015					
R Range	0.0	.0015					
ACCURACY							
Job # Spiked (ETC)		P1714					
Original Result		0					
Amount Spiked		.0382					
Spiked S' Result							
% Recovery		1.31					

To Page No. ____

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ETC ENVIRONMENTAL TESTING and CERTIFICATION

CONVENTIONAL CHEMISTRY LAB

TEST: Phenol, UNITS: mg/L,
METH. REF. # AA/EPA 420.2, MDL: .050,
INSTRUMENT # AA Channel #2,

ANALYZED ON: 11/29/86
BY: D. Herrera/R. Hulit
BOOK # CV-12 P. 113
FROM PAGE # ____

Log Link	Job #	Analyzed Conc.	Dilu	Reported Conc.
17798	P2469	0.030	-	BMDL
	P2477	0.014	-	BMDL
	P2524	0.012	-	BMDL
	P2538	0.012	-	BMDL
	P2539	0.012	-	BMDL
	P2540	0.014	-	BMDL
17799	P3193	0.038	-	BMDL
	P3194	0.028	-	BMDL
17801	P4467	0.004	-	BMDL
17823	P4724	0.002	-	BMDL
17824	P4480	~	-	RPT
17828	P2472	0.028	-	BMDL
	P2473	0.017	-	BMDL
	P2522	0.017	-	BMDL
	P2536	0.025	-	BMDL
	P2548	0.015	-	BMDL
17837	P4709	0.015	-	BMDL
	P4714	0.023	-	BMDL
17864	P2481	0.025	-	BMDL
	P2531	0.006	-	BMDL
	P2541	0.030	-	BMDL
	P2546	0.017	-	BMDL
	P2554		=	RPT
178dc	P4850	0.321	-	RPT

Log Link	Job #	Analyzed Conc	Dilu	Reported Conc
178dc	P4851	~	-	RPT
	P4852	~	-	RPT
	P4853	~	-	RPT
178dc	P4510	0.076	-	.076
	P4511	0.054	-	.054
	P4512	0.056	-	.056
	P4513	0.017	-	BMDL
17878	P2726	0.015	-	BMDL
17886	P3120	0.027	-	BMDL
	P3122	0.010	-	BMDL
	P3124	~	-	OFF SCALE RPT
	P3126	0.084	-	.084
17882	P2543	0.036	-	BMDL
	P2544	0.060	-	.060
	P2545	0.051	-	.051
	P2547	0.017	-	BMDL
	P2549	0.015	-	BMDL
	P2550	0.021	-	BMDL
	P2551	0.031	-	BMDL
	P2552	0.021	-	BMDL

STANDARDS

PREPED ON ____
BY ____
FROM ____ mg/L
STOCK # ____

STANDARD mg/L	VALUE OBTAINED	% of Theoretical
[illegible]	PKH	
.300	85.5	~~85.5%~~
.200	63.5	~~63.5%~~
.100	33.5	~~33.5%~~
.050	18.5	~~18.5%~~

SLOPE	Intercept	Corr. Coef.
270.169	6.3474	0.99719

ADDITIONAL COMMENTS

P4480 - matrix interference
P2554 = " " "
P4850 - RPT for dilution
P4851 -
P4852 - - - - - -
P4853 -
P3124 -
ALL CALCS BY
X = MY + B.

Analyses QA/QC Data Report

QC Batch # PH004

Verified: 11/29/86 RH Hulit

PRECISION

Job # Dup (ETC)	P2469	P4480	P3120	P2551		
Original Result	0.030	matrix	0.028	0.036		
Duplicate Result	0.030		0.026	0.026		
R Range		inter-	0.002	0.010		
ACCURACY						
Job # Spiked (ETC)	P2469	ference	P3120	P2551		
Original Result	0.030	(CH)	0.027	0.031		
Amount Spiked	0.100		.100	.100		
Spiked S' Result	0.123		0.117	0.130		
% Recovery	91.2		90%	90%		

METHOD BLANK	0.019		
Spiked Blank (Known)	.050	.100	
Spiked Blank Result	0.045	0.095	
% Recovery	90%	95%	
EXTERNAL REF. QC	Not Applic.		
Known Value			
$\bar{X}$ Observed Result			
$\bar{X}$ % Recovery			

To Page No. X

ETC ENVIRONMENTAL TESTING and CERTIFICATION

CONVENTIONAL CHEMISTRY LAB

ANALYZED ON: 12-3

TEST: Cyanide, UNITS: mg/l,
METH. REF. #: 335.3, MDL: 0.025,
INSTRUMENT #: #1 (channel 1),

BY: C.M.
BOOK # CY-12 P. 119
FROM PAGE # .

Lab Lab	Job #	ANALYZED CONC.	Dilu	REPORTED CONC.
17837	N4709	0		BmDL
17837	N4714	0		BmDL
17862	P0489	.007		BmDL
17863	P0493	.009		BmDL
17863	P0494	.005		BmDL
17863	P0495	.002		BmDL
17866	P4850	.539		.539
17868	P4510	*		ReDo
17878	P2776	.007		BmDL
17881	P1865	.002		BmDL
17883	N4706	.002		BmDL
17883	N4711	.003		BmDL
17833	P4241	.0197		BmDL
17833	P4242	.0169		BmDL
17833	P4243	.0211		BmDL
17833	P4244	.0186		BmDL
17834	P4248	.0185		BmDL
17834	P4249	.0188		BmDL
17834	P4250	.0231		BmDL
17834	P4251	.0189		BmDL
~~—~~	~~A2224~~	~~.006~~		~~BmDL~~
17693	P2916	.0185		BmDL
17693	P2917	.0312		BmDL
17697	P4748	.006		BmDL

Lab Lab	Job #	ANALYZED CONC	Dilu	REPORTED CONC
17697	P4748	.005		BmDL
17697	P4748	.004		BmDL
17697	P4748	.004		BmDL
17698	P1710	.003		BmDL
17701	N4710	.004		BmDL
17701	N4715	.004		BmDL
17866	P4851	over		RedO
17866	P4852	over		ReDo
17866	P4853	*		ReDo
17868	P4510	*		Redo
17868	P4511	*		Redo
17868	P4512	*		Redo
17868	P4513	*		Redo
17883	N4712	*		Redo
17883	N4713	*		Redo
17889	P2754	*		Redo
17869	P2761	*		Redo
17889	P2774	*		Redo
17889	P2775	*		Redo
17833	P4235	*		Redo
17833	P4236	*		Redo
17833	P4237	*		Redo
17833	P4238	*		Redo
17833	P4239	*		Redo

STANDARDS

PREPED ON 12-2
BY D.B.
FROM mg/L
STOCK #

STANDARD mg/L	VALUE OBTAINED	% of THEORETICAL
.500	.493	98.6%
.400	.405	101.%
.200	.205	102.5%
.100	.102	102%

SLOPE	Intercept	Corr. Coef.

ADDITIONAL COMMENTS

* RPT DUE TO INSTRUMENTATION problem
P4851 10X
P4852 20X

Analyses QA/QC Data Report

QC Batch # CY003

Verified: 12/3/86

METHOD BLANK	.008	
Spiked Blank (Known)	.100	
Spiked Blank Result	.103	
% Recovery	103%	
EXTERNAL REF. QC	EPA	
Known Value	.224	
Observed Result	.228	
% Recovery	101.7%	

PRECISION							
Job # Dup (ETC)	N4709	P4748					
Original Result	0	0.006					
Duplicate Result	0	0.005					
R Range	0.0	0.001					
ACCURACY							
Job # Spiked (ETC)	N4709						
Original Result	0.0						
Amount Spiked	.200						
Spiked S' Result	.201						
% Recovery	99%						

To Page No.

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ETC ENVIRONMENTAL TESTING and CERTIFICATION

LOG LINK 17866

LABORATORY CHRONICLE: Metals Department

Samples P4850 - P4853

	Chemist	Date
Hg Prep	—	—
AA Prep	—	—
ICAP Prep	[illegible]	11/24/86

Lab Supervisor Joan Komarek Date 11/26/86

ETC FORM #101

305144

Technical Report

for

ENVIRONMENTAL STRATEGIES CORP.

WASHINGTON HARBOUR

3050 KK ST. SUITE 325

WASHINGTON, DC 20007

Chain of Custody Data Required for ETC Data Management Summary Reports

ETC Sample No.	Company	Facility	Sample Point	Date	Time	Elapsed Hours
P4851	ENVIRONMENTAL STRATEGIES CORP.	CHAMPION	WCSP-2	861110	1300	

John J. Fitzgerald

Vice President
Research and Operations

This Technical Report is an INSITE℠ service generated by LODESTAR℠ Data Management Software.

TABLE OF CONTENTS

Introduction

This report contains the analytical results on your sample. It is designed to include comprehensive data from the entire analytical process in order to satisfy the needs of various levels of review.

The results obtained from your sample are presented in tabular format immediately following this introduction. Quality assurance data is tabulated along with the appropriate sample results for verification. Depending on the analyses ordered, the quality assurance data may include results from blank, spiked blank, spiked sample (i.e. matrix spike) and replicate sample as well as results from surrogate compound analyses. Quality assurance data for verification of proper instrument performance is also included where appropriate. The report appendices include the chain of custody record for your sample and, where appropriate, the gas chromatograms and mass spectra.

The procedures used in the analysis of the sample are described in this report's methodology section. All analytical procedures within our laboratory are performed within a strictly enforced Quality Assurance Protocol. A description of this Protocol is included in the report.

Results

Sample results, and associated quality assurance data, are always tabulated in one or more of this report's Quantitative Results Tables. The format of each table varies with the class of analysis.

Priority Pollutants

The priority pollutant compounds and elements are listed with their NPDES (National Pollution Discharge Elimination System) numbers, and the Method Detection Limit (MDL) published in the Federal Register. When a compound or element is present below its published MDL it is reported as BMDL (Below Method Detection Limit). When a compound or element is not present at any detectable concentrations it is reported as ND (Not Detected). MDL's for non-aqueous matrices are based on USEPA published MDL's but are adjusted as per sample weight. Matrix spike and replicate analyses, where included, were performed on samples randomly chosen within each quality assurance batch and are therefore not necessarily spikes and replicates of this report's sample. Surrogate compound recovery data and instrument calibration data are included in the Method Performance Data Tables.

ETC ENVIRONMENTAL TESTING and CERTIFICATION

NOV 26, 1986

TABLE 1: QUANTITATIVE RESULTS and QUALITY ASSURANCE DATA

Volatile Compounds - GC/MS Analysis Data (QR01)

Chain of Custody Data Required for ETC Data Management Summary Reports

ETC Sample No.	Company	Facility	Sample Point	Date	Time	Elapsed Hours
P4851	ENVIRONMENTAL STRATEGIES CORP.	CHAMPION	WCSP-2	861110	1300	

NPDES Number	Compound (Acrolein and Acrylonitrile values are screen only.)	Results		QC Replicate		QC Blank and Spiked Blank			QC Matrix Spike		
		Sample Concen. ug/l	MDL ug/l	First ug/l	Second ug/l	Blank Data ug/l	Concen. Added ug/l	% Recov	Unspiked Sample ug/l	Concen. Added ug/l	% Recov
1V	Acrolein	ND	100	ND	ND	ND	800	88	ND	800	98
2V	Acrylonitrile	ND	100	ND	ND	ND	80.0	94	ND	80.0	84
3V	Benzene	ND	4.4	ND	ND	ND	18.0	99	ND	18.0	100
4V	bis(Chloromethyl)ether	ND	10	ND	ND	ND	0	-	ND	0	-
5V	Bromoform	ND	4.7	ND	ND	ND	18.0	92	ND	18.0	90
6V	Carbon tetrachloride	ND	2.8	ND	ND	ND	18.0	103	ND	18.0	98
7V	Chlorobenzene	ND	6.0	ND	ND	ND	18.0	99	ND	18.0	99
8V	Chlorodibromomethane	ND	3.1	ND	ND	ND	18.0	99	ND	18.0	95
9V	Chloroethane	ND	10	ND	ND	ND	18.0	103	ND	18.0	96
10V	2-Chloroethylvinyl ether	ND	10	ND	ND	ND	18.0	0[a]	ND	18.0	0[a]
11V	Chloroform	ND	1.6	ND	ND	ND	18.0	103	ND	18.0	98
12V	Dichlorobromomethane	ND	2.2	ND	ND	ND	18.0	100	ND	18.0	96
13V	Dichlorodifluoromethane	ND	10	ND	ND	ND	18.0	109	ND	18.0	104
14V	1,1-Dichloroethane	ND	4.7	ND	ND	ND	18.0	100	ND	18.0	99
15V	1,2-Dichloroethane	ND	2.8	ND	ND	ND	18.0	104	ND	18.0	96
16V	1,1-Dichloroethylene	ND	2.8	ND	ND	ND	18.0	101	ND	18.0	97
17V	1,2-Dichloropropane	ND	6.0	ND	ND	ND	18.0	98	ND	18.0	101
18V	cis-1,3-Dichloropropylene	ND	5.0	ND	ND	ND	18.0	97	ND	18.0	100
19V	Ethylbenzene	ND	7.2	ND	ND	ND	18.0	100	ND	18.0	100
20V	Methyl bromide	ND	10	ND	ND	ND	18.0	103	ND	18.0	109
21V	Methyl chloride	ND	10	ND	ND	ND	18.0	107	ND	18.0	109
22V	Methylene chloride	ND	2.8	209	206	3.93	18.0	98	45.0	18.0	89
23V	1,1,2,2-Tetrachloroethane	ND	6.9	ND	ND	ND	18.0	101	ND	18.0	106
24V	Tetrachloroethylene	ND	4.1	ND	ND	ND	18.0	98	ND	18.0	103
25V	Toluene	ND	6.0	ND	ND	ND	18.0	100	ND	18.0	102
26V	1,2-Trans-dichloroethylene	ND	1.6	ND	ND	ND	18.0	97	ND	18.0	99
27V	1,1,1-Trichloroethane	ND	3.8	ND	ND	ND	18.0	104	ND	18.0	97
28V	1,1,2-Trichloroethane	ND	5.0	ND	ND	ND	18.0	104	ND	18.0	100
29V	Trichloroethylene	3.28	1.9	ND	ND	ND	18.0	93	ND	18.0	87
30V	Trichlorofluoromethane	ND	10	ND	ND	ND	18.0	105	ND	18.0	99
31V	Vinyl chloride	ND	10	ND	ND	ND	18.0	110	ND	18.0	99
18V	trans-1,3-Dichloropropylene	ND	10	ND	ND	ND	18.0	94	ND	18.0	96

[a] Recovery normally variable using established methodology.

305152

ETC ENVIRONMENTAL TESTING and CERTIFICATION

NOV 29, 1986

TABLE 1: QUANTITATIVE RESULTS

Metals - Analysis Data (QR52)

Chain of Custody Data Required for ETC Data Management Summary Reports

ETC Sample No.	Company	Facility	Sample Point	Date	Time	Elapsed Hours
P4851	ENVIRONMENTAL STRATEGIES CORP.	CHAMPION	WCSP-2	861110	1300	

Compound	Results									
	Sample Concen. ug/l	MDL ug/l								
Barium	61	3.2								
Chromium	BMDL	26								
Copper	BMDL	13								
Iron	BMDL	140								
Manganese	110	6.4								
Nickel	ND	11								
Sodium	12900	72								
Zinc	67	2.9								

ETC ENVIRONMENTAL TESTING and CERTIFICATION

DEC 13, 1986

TABLE 1: QUANTITATIVE RESULTS and QUALITY ASSURANCE DATA

Conventional Analysis Data (QR10)

Chain of Custody Data Required for ETC Data Management Summary Reports

ETC Sample No.	Company	Facility	Sample Point	Date	Time	Elapsed Hours
P4851	ENVIRONMENTAL STRATEGIES CORP.	CHAMPION	WCSP-2	861110	1300	

NPDES Number	Results: Sample Concen. mg/l	Results: MDL mg/l								
Fluoride	.21	.10								
Nitrate as N	7.93	.10								
Sulfate as S04	94	2								
Phenolics, Total	<.050	.050								
Cyanide, Total	.029	.025								
Solids, total suspended	890	2								

ETC ENVIRONMENTAL TESTING and CERTIFICATION

NOV 25, 1986

TABLE 2: METHOD PERFORMANCE DATA
Surrogate Recovery - Aqueous Matrices (QR20)

Chain of Custody Data Required for ETC Data Management Summary Reports

ETC Sample No.	Company	Facility	Sample Point	Date	Time	Elapsed Hours
P4851	ENVIRONMENTAL STRATEGIES CORP.	CHAMPION	WCSP-2	86111	1300	0

Compound	Amount added ug	% Recovery	Control Limits.	
			Lower	Upper
VOLATILE FRACTION (GC/MS)				
Toluene-D8	.250	100	88	110
p-Bromofluorobenzene	.250	103	86	115
1,2-Dichloroethane-D4	.250	104	76	114
ACID FRACTION (GC/MS)				
Phenol-D5	-	-	10	94
2-Fluorophenol	-	-	21	100
2,4,6-Tribromophenol	-	-	10	123
BASE/NEUTRAL FRACTION (GC/MS)				
Nitrobenzene-D5	-	-	35	114
2-Fluorobiphenyl	-	-	43	116
Terphenyl-D14	-	-	33	141
PESTICIDE/PCB FRACTION (GC)				
Dibutylchlorendate	-	-	24..	154..

* IFB EPA Control Limits
** Advisory Limits Only

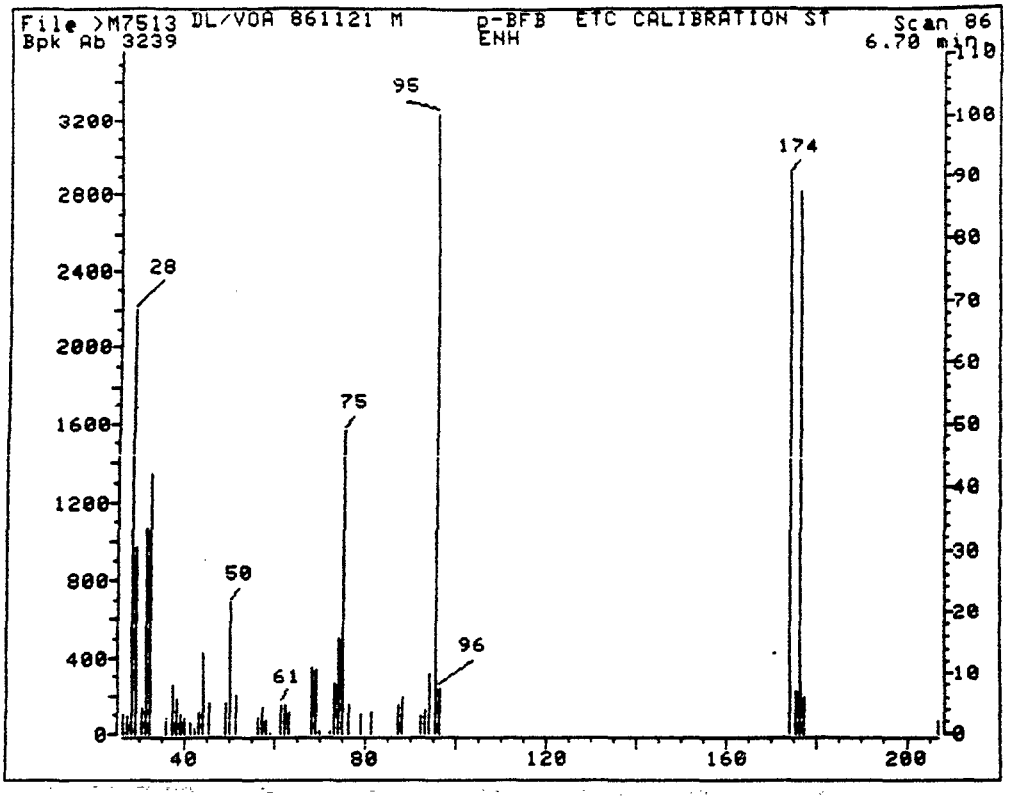

TABLE 2: METHOD PERFORMANCE DATA (QR21)

GC/MS Tuning Data - Bromofluorobenzene (BFB) for Volatiles Analysis

m/z	Ion Abundance Criteria	% Relative Abundance Base Peak	% Relative Abundance Appropriate Peak	Status
50	15-40% of mass 95	21.09	21.09	Ok
75	30-60% of mass 95	48.39	48.39	Ok
95	Base peak, 100% relative abundance	100.00	100.00	Ok
96	5-9% of mass 95	7.22	7.22	Ok
173	Less than 1% of mass 95	0.00	0.00	Ok
174	Greater than 50% of mass 95	89.98	89.98	Ok
175	5-9% of mass 174	6.74	7.49	Ok
176	95-101% of mass 174	87.27	96.99	Ok
177	5-9% of mass 176	5.98	6.86	Ok

Injection Date: 11/21/86
Injection Time: 20:42
Run No: >M7513
Spectrun No: 86

Analyst: [signature]
Processor: [signature]
QC Batch: QV 5431
Samples: P4240, P4241, P4242, P4243, P4244, P4236, P4237, P4239, P4235, P533, P5415, P5414, P4850, P4851, P485

11/25/86

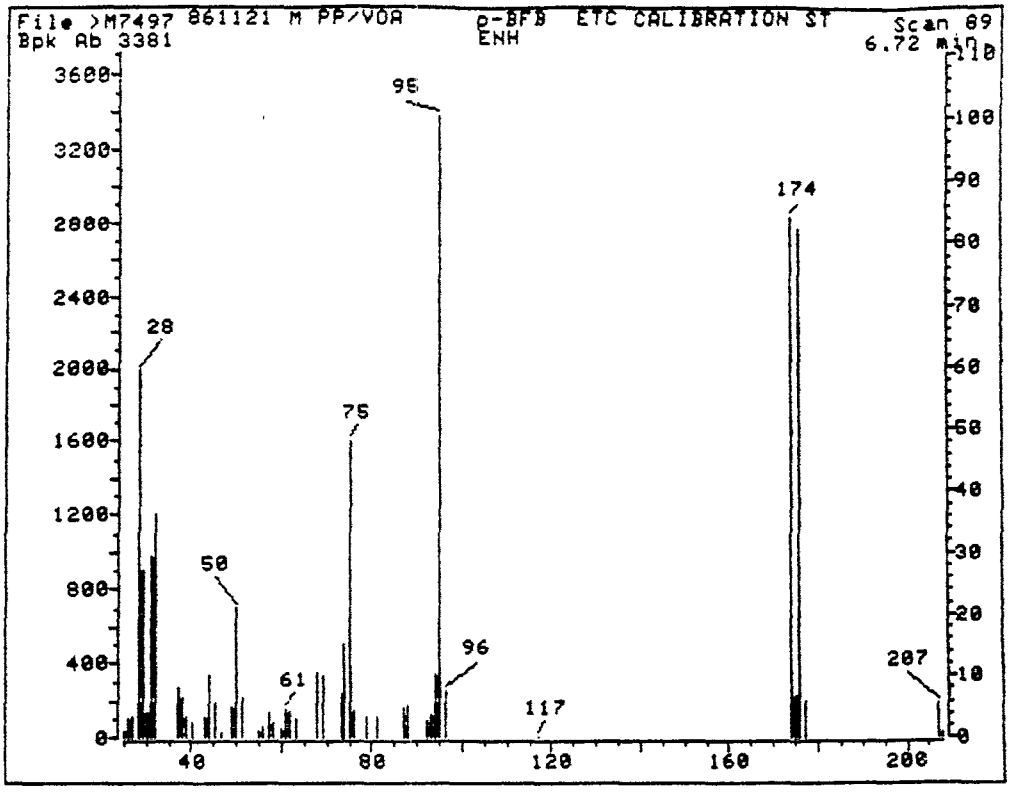

TABLE 2: METHOD PERFORMANCE DATA (QR21)

GC/MS Tuning Data - Bromofluorobenzene (BFB) for Volatiles Analysis

m/z	Ion Abundance Criteria	% Relative Abundance Base Peak	% Relative Abundance Appropriate Peak	Status
50	15-40% of mass 95	20.80	20.80	Ok
75	30-60% of mass 95	47.52	47.52	Ok
95	Base peak, 100% relative abundance	100.00	100.00	Ok
96	5-9% of mass 95	7.18	7.18	Ok
173	Less than 1% of mass 95	0.00	0.00	Ok
174	Greater than 50% of mass 95	83.99	83.99	Ok
175	5-9% of mass 174	6.60	7.85	Ok
176	95-101% of mass 174	82.16	97.82	Ok
177	5-9% of mass 176	5.86	7.13	Ok

Injection Date: 11/21/86
Injection Time: 05:57
Run No: >M7497
Spectrun No: 89

Analyst: [signature]
Processor: [illegible]
QC Batch: QV5931
Samples: P4240, P4241, P4242, P4243, P4236, P4237, P4239, P4235, P5415, P5414, P4850, P4851, P

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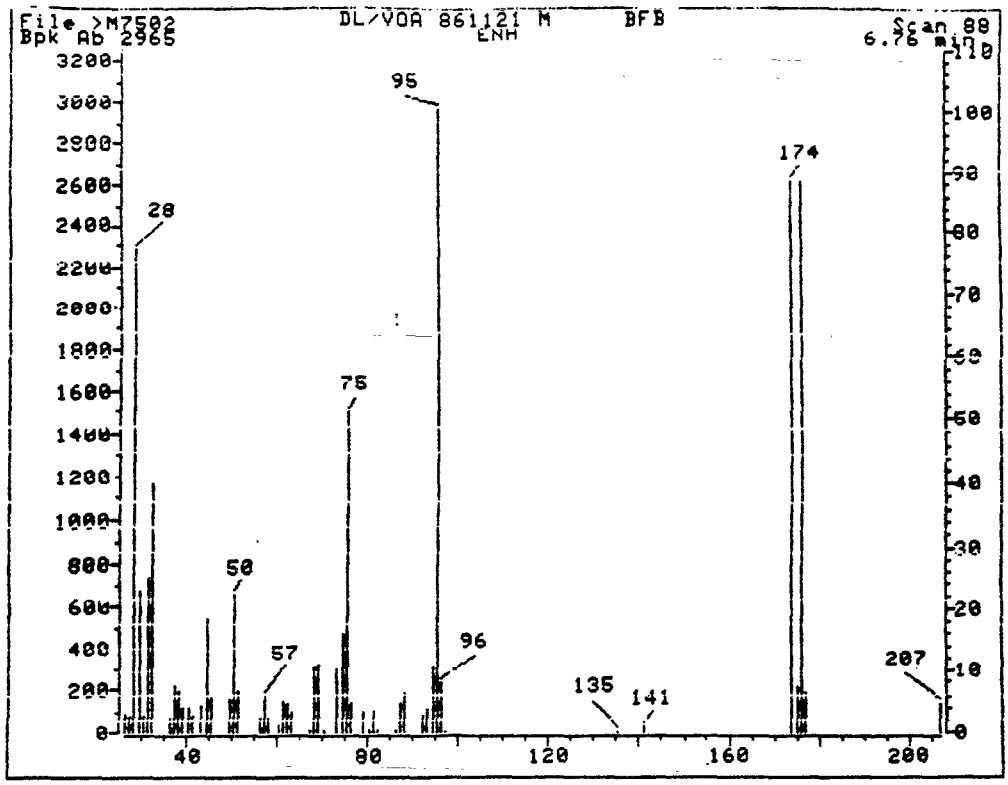

TABLE 2: METHOD PERFORMANCE DATA (QR21)

GC/MS Tuning Data - Bromofluorobenzene (BFB) for Volatiles Analysis

m/z	Ion Abundance Criteria	% Relative Abundance Base Peak	% Relative Abundance Appropriate Peak	Status
50	15-40% of mass 95	22.00	22.00	Ok
75	30-60% of mass 95	50.62	50.62	Ok
95	Base peak, 100% relative abundance	100.00	100.00	Ok
96	5-9% of mass 95	7.63	7.63	Ok
173	Less than 1% of mass 95	0.00	0.00	Ok
174	Greater than 50% of mass 95	88.52	88.52	Ok
175	5-9% of mass 174	7.03	7.95	Ok
176	95-101% of mass 174	88.43	99.89	Ok
177	5-9% of mass 176	6.31	7.13	Ok

Injection Date: 11/21/86
Injection Time: 09:32
Run No: >M7502
Spectrun No: 88

Analyst: [signature]
Processor: [signature]
QC Batch: QV 5931
Samples: P4240, P4241, P4242, P4243, P4244, P4236, P4237, P4236, P4235, P5332, P5415, P5414, P4850, P4851, P4852

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Methodology
for
GC/MS Analysis of Priority Pollutant Compounds

The methods employed in the GC/MS analysis for priority pollutants are established EPA methods. Rigid compliance with the instrument parameters and performance criteria of the published methods was achieved. In some cases, the precise amounts of sample used and the sample handling procedures vary with the complexity of the sample matrix. Qualitative identification of the priority pollutants was performed using the relative retention times, the relative abundance of three characteristic ions and the abundance ratios. The entire mass spectrum was reviewed to confirm each identification. Quantitative analysis of detected compounds was performed by using a response factor generated by a major characteristic ion of the specific compound and an internal standard.

Compounds, in addition to those on the priority pollutant list, were identified through a computer-aided search of the NBS-EPA spectra library. After review the identifications are included in a separate tabulation and labelled "tentatively identified".

Volatile Priority Pollutant Compounds

For the analysis of Volatile priority pollutants, EPA Method 624 was used. The method can be summarized as follows: Helium is bubbled through a 5 ml water sample contained in a specially designed purging chamber at ambient temperature. The purgeable volatile organic compounds are transferred from the aqueous phase to the vapor phase. The vapor is swept through a sorbent column where the organic components are trapped. After the purge cycle is complete, the sorbent column is heated and backflushed with helium to desorb the organic purgeables onto a gas chromatographic column. The gas chromatograph is temperature programmed to separate the purgeable mixture. The separated purgeable components are then identified and quantitated using a computerized mass spectrometer.

Acid, Base/Neutral and Pesticide Priority Pollutant Compounds

For the analysis of the Acid, Base/Neutral and Pesticide priority pollutants in an aqueous liquid matrix, EPA Method 625 was used. The method can be summarized as follows: A measured volume of sample, approximately 1 liter, is adjusted to a pH greater than 11 and extracted with methylene chloride. The pH of the sample is adjusted to a value less than 2 and extracted with an aliquot of fresh methylene chloride. A separatory funnel or continuous extractor is used to perform the extractions. The two extracts are dried and concentrated to a 1 ml final volume. Each extract is injected into a GC/MS instrument specifically configured for the correct fraction.

Methodology for Analysis of Metals

AQUEOUS

The determination of metals in aqueous samples is performed according to the methods published by EPA in "Methods for Chemical Analysis of Water and Wastes," EPA-600/4-79-020, March, 1983, and the Federal Register, October 26, 1983. Arsenic, selenium and thallium are determined by furnace AA; silver, aluminum, barium, beryllium, boron, cadmium, calcium, chromium, copper, cobalt, iron, magnesium, manganese, molybdenum, nickel, lead, sodium, antimony, tin, titanium, vanadium, and zinc are determined by ICP emission spectrometry, except where lower levels of detection are required: in these cases (e.g. lead in groundwater monitoring samples) furnace AA is used. All furnace AA parameters are run by method of standard additions. The determination of mercury is performed by cold vapor AA.

EP TOXICITY

The determination of metals in aqueous EP Toxicity leachates is performed according to the methods published by EPA in "Test Methods for Evaluating Solid Waste" EPA SW-846, revised April, 1984 and the Federal Register, Oct. 26, 1983, 1979. Silver, arsenic, barium, cadmium, chromium, lead and selenium are determined by ICP emission spectrometry. Mercury is determined using cold vapor AA. For leachates that are organic in nature, the analyses are performed according to the methods described under ***OIL/SLUDGE*** below.

SOIL/SEDIMENT

The determination of silver, beryllium, cadmium, chromium, copper, nickel, antimony, lead, and zinc in sediment samples is performed according to methods published by EPA in "Interim Methods for the Sampling and Analysis of Priority Pollutants in Sediments and Fish Tissue", EPA 600/4-81-055, October 1980. Mercury is determined according to the sediment method published by EPA in "Method for Chemical Analysis of Water and Wastes", EPA 600/4-79-020, March 1983. Arsenic, selenium and thallium are determined by furnace AA using nitric acid in a closed decomposition vessel for sample digestion.

OIL/SLUDGE

The determination of silver, aluminum, boron, barium, beryllium, calcium, cadmium, copper, chromium, cobalt, iron, magnesium, manganese, molybdenum, sodium, nickel, lead, antimony, tin, titanium, vanadium, and zinc in sludge/petroleum-based samples is performed by ICP emission spectrometry using a magnesium nitrate dry ashing digestion technique. Arsenic, selenium and thallium are determined by furnace AA using nitric acid in a closed decomposition vessel for sample digestion. Mercury is determined by cold vapor AA using the same digestion technique.

Summary of Quality Assurance/Quality Control Procedures (QA/QC)

ETC bases its quality assurance protocols on the following government guidelines:

- "Handbook for Analytical Quality Control in Water and Wastewater Laboratories", EPA-600/4-79-019, March 1979;
- National Enforcement Investigation Center Policies, and Procedures manual; EPA-330/9/79/001-R, October 1979;
- the recommended guidelines for EPA Methods 624 and 625. (Federal Register, December 3, 1979, updated on October 26, 1984);
- "Manual of Analytical Methods for the Analysis of Pesticides in Humans and Environmental Samples," EPA 600/8-80-038, June 1980;
- "Determination of 2,3,7,8-TCDD in Soil and Sediment" EPA, Region VII, Kansas City, September 1983;
- Organic Analysis: Multi-media Multi Concentration-IFB WA84-A267; and
- Dioxin Analysis:Soil/Sediment Matrix; Multi-Concentration; Selected Ion Monitoring with Jar Extration Procedure-IFB WA84-A002

However, we have modified our protocols to provide a higher level of QA/QC than the guidelines require. For example, we analyze a higher than required number of quality control samples and we pay especially careful attention to the certification of the "reference standard" compounds we use in analysis. Below are listed the key QA/QC elements for the methods we used.

Analysis of Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry

- Each batch of 13 samples consists of 9 customer samples (at a maximun), one blank sample, one spiked blank, one spiked sample and one replicate sample. This amounts to a 30% quality control factor.
- Three surrogate compounds are added to each sample in the batch of 13.
- A blind quality control sample is introduced to the laboratory for analysis on a wee[illegible]
- Each GC/MS is checked and retuned, if necessary, at the beginning of each day to ensure that its performance on bromofluorobenzene (BFB) meets the EPA criteria.
- A calibration curve for quantitation is prepared using a mixture of Volatile Organic Priority Pollutant "standards" at a minimum of 3 different concentrations and using a mixture of 3 internal standards at a constant concentration.
- The calibration curve is verified with a mixture of priority pollutant standards every day. If the response factors vary greater than 25%, the instrument must be recalibrated.

Analysis of Organic Compounds Extracted in Acid or Base/Neutral Solutions by Gas Chromatography/Mass Spectrometry

- Each batch of 20 samples consists of 16 customer samples (at a maximum), one blank sample, one spiked blank (for water matrices), one sample spiked with the priority pollutant standard mixture and a duplicate customer sample. This amounts to a 20% quality control factor.

- Three surrogate compounds are added to each sample in the batch for Base/Neutral analysis.
- Three surrogate compounds are added to each sample in the batch for Acid analysis.
- A blind quality control sample is introduced to the laboratory for analysis on a weekly basis.
- Each GC/MS is checked and retuned, if necessary, at the beginning of each day to ensure that its performance on decafluorotriphenylphosphine (DFTPP) meets the EPA criteria.
- A calibration curve for quantitation is prepared using a mixture of standards composed of either the Organic Acid or Base/Neutral Extractable Compounds at a minimum of 3 concentrations and using five internal standards for quantitation.

Analysis of Metals

All Samples

- New standards are prepared for each batch of samples
- Normal calibration is performed using a blank sample and four standards that have been through the sample preparation procedure. A regression analysis is used to construct the calibration curve.
- All EP Toxicity samples and all samples determined by furnace atomic absorption are calculated by the "method of additions".
- For each sample analysis that requires the use of the "method of additions" technique, a three point calibration is performed using U.S. EPA "Methods for Chemical Analysis of Water and Wastes, 1979". Results are obtained using linear regression analysis. Any regression with a coefficient of correlation below 0.990 is considered suspect, necessitating review of calibration data or sample re-analysis.
- In constructing the normal calibration curves the lowest concentration levels we use are values greater than or equal to 5 times the Instrumental Detection Limit (IDL).
- All calibration standards are analyzed in duplicate, at a minimum.
- Independent reference standards are used to check the accuracy of calibration standards.
- A check standard is analyzed every ten samples to validate the normal calibration curve.
- One customer sample out of every ten is analyzed in triplicate.

Homogeneous Samples (except for Mercury analysis)

Samples are analyzed in batches of 30 or less. For batches in which the sample matrices are homogeneous, the QC program is a minimum of 25% and consists of analyzing:

- 3 sets of triplicate analyses;
- 2 Replicate spikes;
- 1 Independent reference standard;
- 4 Calibration standards (processed using the sample preparation method);
- 4 Calibration standards (without sample preparation); and
- 1 Reagent Blank.

Heterogeneous Samples (except for Mercury analysis)

Samples are analyzed in batches of 30 or less. For batches in which the sample matrices are heterogeneous, the QC program is a minimum of 35% and consists of analyzing

- 3 sets of triplicate analyses;
- 2 Replicate spikes;
- 1 Replicate independent reference standards;
- 4 Calibration standards (processed using the sample preparation method);
- 1 Procedural Blank;
- 4 Calibration standards (without sample preparation); and
- 1 Reagent Blank.

Analysis of Mercury

To analyze samples for mercury we group them by matrix in batches of 30 or less. Our QC program is a minimum of 30% and consists of analyzing:

- each of the 30 customer samples in duplicate;
- 3 sets of triplicate anaylses;
- 2 Replicate spikes;
- 2 Replicate independent reference standards;
- 10 Calibration standards (processed using the sample preparation method); and
- 2 Procedural Blanks.

Analysis of Pesticides, Herbicides and PCB's by Gas Chromatography

Pesticide, herbicide and PCB samples are grouped in batches of 16 customer samples or less according to the type of analysis to be performed. The QC program for each of these three types of analyses is a minimum of 20% and consists of analyzing:

- 1 procedural blank sample(a reagent blank is analyzed in the case of non-water matrices);
- 1 spiked blank sample (the spiked blank is eliminated in the case of non-water matrices);
- 1 replicate sample;
- 1 replicate spiked sample; and
- 1 known refernece QC sample for at least each 100 samples analyzed.

The instrument is calibrated each run with three standards, and checked every 10 samples.

Analysis of Cyanides, Phenols, Fluoride, Chloride, Nitrate and Nitrite

- All parameters are analyzed using a Technicon Autoanalyzer II GT.
- 3 calibration standards are analyzed at the beginning and end of each batch.

- Each batch (up to 80 samples) consists of analyzing one blank, one spiked blank, one duplicate and spiked sample every 20 samples, and an EPA known reference sample.

Analysis of Total Organic Carbon (TOC)

TOC samples are analyzed on a daily basis with the number of samples analyzed per day dependent on the request for duplicate or quadruplicate analyses. The quality control program is designed to maintain the appropriate amount of QC and consists of the following elements:

- Daily instrument calibration
- One blank
- Standard recalibration every 10 samples
- Spiked samples at a low and high level
- Every sample is run in duplicate at a minimum

Analysis of Total Organic Halide (TOX)

- Blank reagent water for absolute carbon background must contain less than 5 ug/l of halide (as chloride).
- Using a trichlorophenol standard, the mean adsorption efficiency must be within +/- 15% of the standard value.
- Calibration standards are run every 10 samples.
- Every sample is run in duplicate at a minimum.

Analysis of 2,3,7,8-TCDD (Dioxin) by GC/MS (SIM)

- Each sample is dosed with a known quantity of $^{13}C_{12}$-2,3,7,8-TCDD as internal standard and $^{37}Cl_4$-TCDD as surogate standard. The action limits for surrogate standard results is +/- 40% of the true value. Samples showing surrogate standard results outside of these limits are reextracted and reanalyzed.
- Two laboratory "method blanks" are run along with each set of 24 or fewer samples. The method blank is also dosed with the internal standard and surrogate standard.
- At least one matrix spiked sample set is run per batch to determine intralaboratory precision.
- Qualitative Requirements. The following are met in order to confirm the presence of native 2,3,7,8-TCDD:

  a. Isomer specificity must be demonstrated initially and verified once per 8-hour work shift. The verification consists of injecting a mixture containing TCDD isomers which elute close to 2,3,7,8-TCDD. The 2,3,7,8-TCDD must be separated from interferring isomers, with no more than 25% valley relative to the 2,3,7,8-TCDD peak.

  b. The 320/322 ratio is within the range of 0.67 to 0.67.

  c. Ions 320, 322, and 257 are all present and maximize together the signal to mean noise ratio must be 2.5 to 1 or better for all 3 ions.

  d. The retention time is equal (within 3 seconds) the retention time for the isotopically labeled 2,3,7,8-TCDD.

  e. At least one of the positives can be confirmed by obtaining partial scan spectra from mass 150 to mass 350. The partial scan guidelines are as follows:

. the 320/324 ratio should be 1.58 +/- 0.16

. the 257/259 ratio should be 1.03 +/- 0.10

. the 194/196 ratio should be 1.54 +/- 0.15

- One sample is spiked with native 2,3,7,8-TCDD at a level of 1.0 PPB (for soil) for each set of 24 or fewer samples.
- In cases where no native 2,3,7,8-TCDD is detected, the actual detection limit is estimated and reported based on a signal to noise ratio of 2.5 to 1 at ions 320 and 322.
- For each sample, the internal standard is present with at least a 10 to 1 signal to noise ratio for both mass 332 and mass 334. Also, the internal standard 332/334 ratio must be within the range of 0.67 to 0.87.

Subcontractor QA/QC

Each subcontractoer is required to maintain an appropriate level of quality control. To insure this, each subcontractor is required to submit to ETC the quality control data for all analyses it performs. This data is kept on file at ETC. In general, the amount of quality control required is one duplicate sample with one spiked sample for every ten analyses.

Chain-of-Custody

The chain-of-custody procedure is part of our quality assurance protocol. We believe our chain-of-custody record fully complies with the legal requirements of federal, state and local government agencies and of the courts of law. The record covers:

- labeling of sample bottles, packing the Sample Shuttle and transferring the Shuttle under seal to the custody of a shipper;
- outgoing shipping manifests;
- the chain-of-custody form completed by the person(s) breaking the Shuttle seal, taking the sample, resealing the Shuttle and transferring custody to a shipper;
- incoming shipping manifests;
- breaking the Shuttle's resea
- storing each labeled sample bottle in a secured area;
- disposition of each sample to an analyst or technician; and
- the use of the sample in each bottle in a testing procedure appropriate to the intended purpose of the sample.

The records show for each link in this process:

- the person with custody; and
- the time and date each person accepted or relinquished custody.

Appendix A

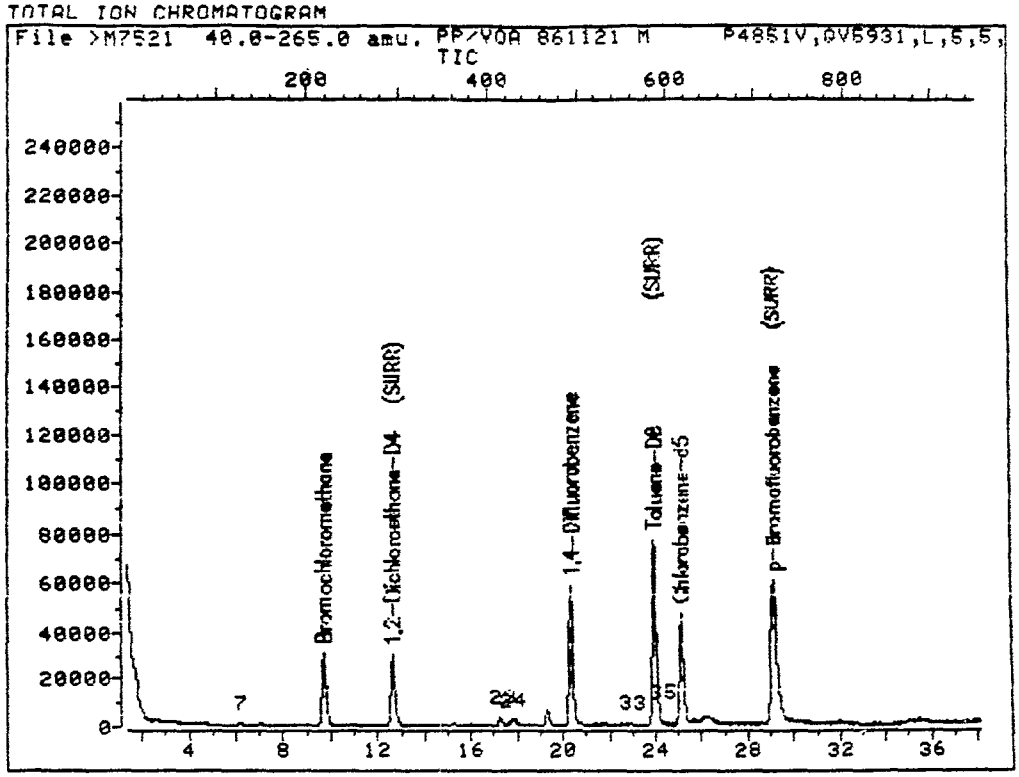
Mass Spectral Data for Quantitated Compounds

1) A total ion chromatogram for each sample analyzed by a GC/MS instrument.

2) A Quant. report used by the analyst to determine qualitative and quantitative results of the compounds present.

3) A mass spectrum and a reference spectrum for each priority pollutant compound detected in the sample.

TOTAL ION CHROMATOGRAM



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Misc: P4851V,QV5931,L,5,5,

Id File: MVOA::US
Title: Volatile Priority Pollutant ID FILE
Last Calibration: 861121 12:01

Operator ID: DG1199
Quant Time: 861122 04:51
Injected at: 861122 04:12

QUANT REPORT

Operator ID: DG1199 Quant Rev: 6 Quant Time: 861122 04:51
Output File: ^M7521::AQ Injected at: 861122 04:12
Data File: >M7521::U4 Dilution Factor: 1.00000
Name: PP/VOA 861121 M
Misc: P4851V,QV5931,L,5,5,

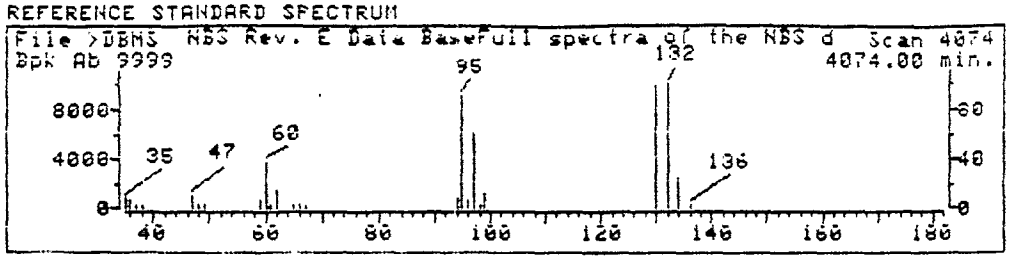
ID File: MVOA::US
Title: Volatile Priority Pollutant ID FILE
Last Calibration: 861121 12:01

	Compound		R.T.	Scan#	Area	Conc	Units	q
1)	*Bromochloromethane		9.70	217	65287	250.00	NG	94
~~7)~~	~~Methylene chloride~~		~~6.14~~	~~125~~	~~2894~~	~~20.13~~	~~NG~~	~~92~~
16)	*1,4-Difluorobenzene		20.35	492	257366	250.00	NG	82
17)	1,2-Dichloroethane-D4	(SURR)	12.64	293	59194	260.91	NG	96
23)	Trichloroethylene		17.25	412	6765	16.40	NG	95
~~24)~~	~~Benzene~~		~~17.72~~	~~424~~	~~4623~~	~~4.46~~	~~NG~~	~~95~~
30)	*Chlorobenzene-d5		25.11	615	178018	250.00	NG	97
~~33)~~	~~Tetrachloroethylene~~		~~22.87~~	~~557~~	~~1737~~	~~3.58~~	~~NG~~	~~83~~
34)	Toluene-D8	(SURR)	23.95	585	321390	248.99	NG	94
~~35)~~	~~Toluene~~		~~24.14~~	~~590~~	~~2561~~	~~2.01~~	~~NG~~	~~96~~
38)	p-Bromofluorobenzene	(SURR)	29.14	719	190591	258.04	NG	95

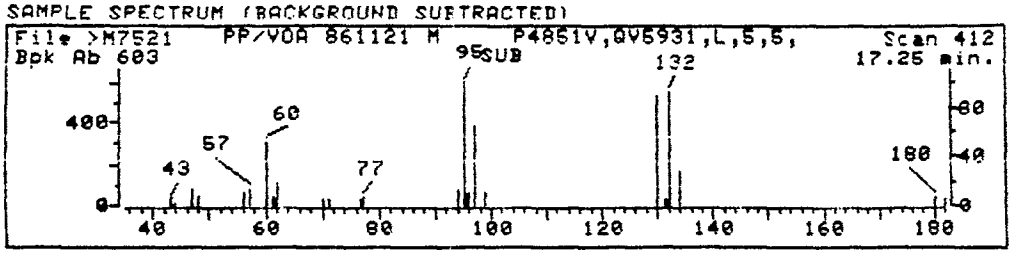
* Compound is ISTD

snc 11/24/86

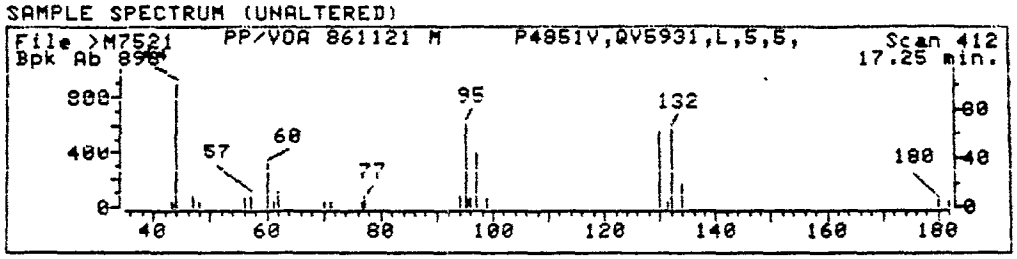
REFERENCE STANDARD SPECTRUM



SAMPLE SPECTRUM (BACKGROUND SUBTRACTED)



SAMPLE SPECTRUM (UNALTERED)



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Injected at: 861122 04:12

Quant Output File: ^M7521::AQ
Quant ID File: MVOA::US
Last Calibration: 861121 12:01

Compound No: 23
Compound Name: Trichloroethylene
Scan Number: 412
Retention Time: 17.25 min.
Quant Ion: 95.0
Area: 6765
Concentration: 16.40 NG
q-value: 95

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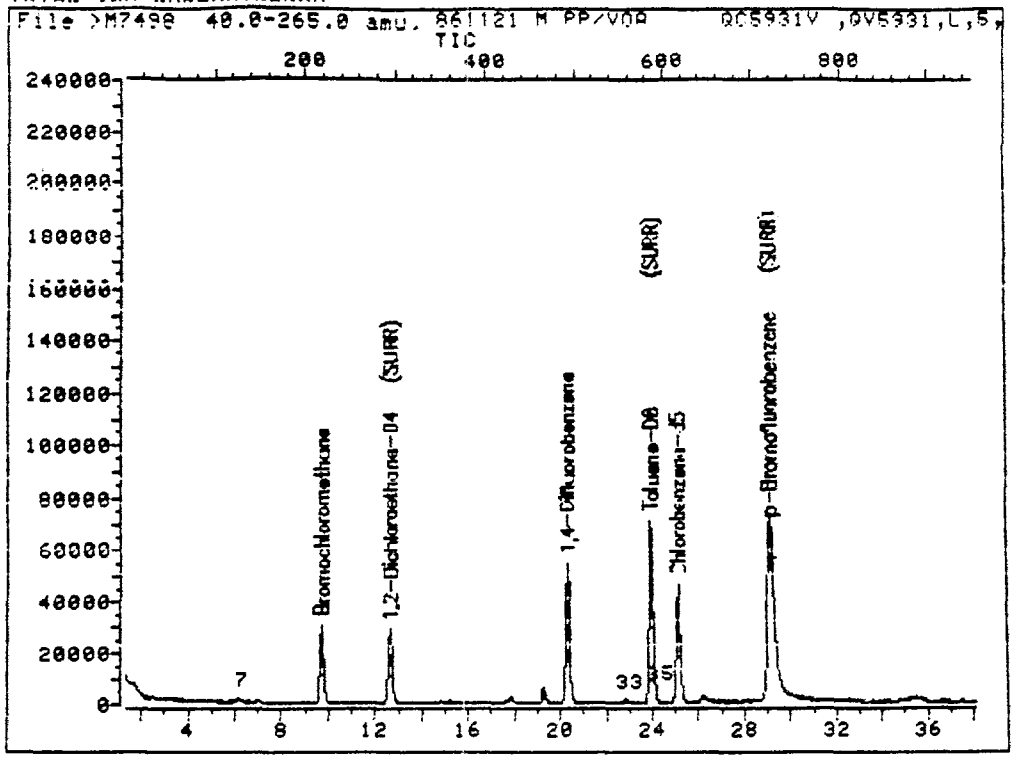
Appendix C1
GC/MS Subsidiary Data

TOTAL ION CHROMATOGRAM



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Misc: QC5931V ,QV5931,L,5,5,

Id File: MVOA::US
Title: Volatile Priority Pollutant ID FILE
Last Calibration: 861121 12:01

Operator ID: JQ6275
Quant Time: 861121 12:03
Injected at: 861121 06:18

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QUANT REPORT

Operator ID: JW6275 Quant Rev: 6 Quant Time: 861121 12:03
Output File: ^M/498::AQ Injected at: 861121 06:18
Data File: >M/498::U3 Dilution Factor: 1.00000
Name: 861121 M PP/VOA
Misc: QC5931V ,QV5931,L,5,5,

ID File: MVOA::US
Title: Volatile Priority Pollutant ID FILE
Last Calibration: 861121 12:01

	Compound		R.T.	Scan#	Area	Conc	Units	q
1)	*Bromochloromethane		9.70	217	66376	250.00	NG	99
7)	Methylene chloride		6.18	126	2829	19.63	NG	86
16)	*1,4-Difluorobenzene		20.31	491	249275	250.00	NG	82
17)	1,2-Dichloroethane-D4	(SURR)	12.65	293	57076	259.74	NG	94
30)	*Chlorobenzene-d5		25.11	615	170859	250.00	NG	99
~~33)~~	~~Tetrachloroethylene~~		~~22.83~~	~~556~~	~~2829~~	~~6.08~~	~~NG~~	~~94~~
34)	Toluene-D8	(SURR)	23.95	585	307632	248.31	NG	91
~~35)~~	~~Toluene~~		~~24.15~~	~~598~~	~~1931~~	~~1.58~~	~~NG~~	~~92~~
38)	p-Bromofluorobenzene	(SURR)	29.10	718	181687	256.29	NG	97

* Compound is ISTD

SNC 11/24/86

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Appendix D
Subcontractor's Data

1) A copy of the originating subcontractor's report is included for all data not generated within ETC's laboratory.

ETC ENVIRONMENTAL TESTING and CERTIFICATION

Subcontracted Analytical Results

REV. 1

ETC Job # P141851

Lab ID: L86272-G2

Submitted by: SNICHUN

Date: 11-21-86

Facility: ____ (Facility Code)

Sample Point: ____ – ____ (Source Code / Sample Point ID)

Date Sampled: ____ (Y Y M M D D)

Time Sampled: ____ (H H : M M)

Line No.	Parameter	Table	Units Of Measure	Value	MDL	Comments
CONVENTIONALS						
1	Chloride	QR 10	mg/l			
2	Fluoride	QR 10	mg/l			
3	Nitrate as N	QR 10	mg/l			
4	Sulfate as SO4	QR 10	mg/l	94	2	
5	Phenolics, Total	QR 10	mg/l			
6	Total Organic Halides (TOX)	QR 10	ug/l			
	Total Organic Halides (TOX)	QR 10	ug/l			
	Total Organic Halides (TOX)	QR 10	ug/l			
	Total Organic Halides (TOX)	QR 10	ug/l			
7	Total Organic Carbon	QR 10	mg/l			
	Total Organic Carbon	QR 10	mg/l			
	Total Organic Carbon	QR 10	mg/l			
	Total Organic Carbon	QR 10	mg/l			
8	Specific Conductance (Lab)	QR 10	um/cm			
	Specific Conductance (Lab)	QR 10	um/cm			
	Specific Conductance (Lab)	QR 10	um/cm			
	Specific Conductance (Lab)	QR 10	um/cm			
9	pH (Lab)	QR 10	std			
	pH (Lab)	QR 10	std			
	pH (Lab)	QR 10	std			
	pH (Lab)	QR 10	std			
10	Coliform, Total	QR 10	C/100			
11	Coliform, Fecal	QR 10	C/100			
12	Gross Alpha	QR 10	PCi/l			
13	Gross Beta	QR 10	pCi/l			
14	Acidity as CaCO3		mg/l			
15	Alkalinity as CaCO3		mg/l			
16	Ammonia as N		mg/l			
17	Bicarbonate as CaCO3		mg/l			
18	Biochemical Oxygen Demand		mg/l			
19	Carbonate as CaCO3		mg/l			
20	Chemical Oxygen Demand		mg/l			
21	Color, Apparent (Lab)		Pt/Co			
22	Cyanide, Total		mg/l			
23	Hardness as CaCO3		mg/l			
24	Nitrite as N		mg/l			
25	Nitrogen Total Kjeldahl (TKN)		mg/l			
26	Nitrogen, Total Organic		mg/l			
27	Odor (Lab)		TON			
28	Oil and Grease (grav, IR)		mg/l			
29	Phosphate, ortho		mg/l			
30	Phosphate, Total		mg/l			
31	Solids, Total		mg/l			
32	Solids, Total Dissolved (ROE) 180°		mg/l			
33	Solids, Total Suspended		mg/l	890	2	
34	Sulfide as S		mg/l			
35	Surfactants (MBAS/LAS)		mg/l			
36	Turbidity (Lab)		NTU			

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Appendix E

Chain-of Custody Forms

1. A field Chain-of-Custody form (CC1) is included for all samples shipped by ETC shuttle.

2. An in-house sample Chain-of Custody form is included for all samples not shipped by ETC shuttle.

3. Any additional Chain-of-Custody material provided by a client or by a client's sampling agent is also included.

4. A subcontractor's Chain-of-Custody form is included for any analytical work not performed within ETC's laboratory.

5. Analysis and Extraction Custody forms are included for the period the sample was in ETC's possession.

ETC ENVIRONMENTAL TESTING and CERTIFICATION — ORIGINAL

CHAIN OF CUSTODY FORM (CC1)

Seal No. 67753 ETC Job # P4851

Date Sealed 6 NOV. 1986 By: M.I.

Company: HELLERTOWN MANUFACTURING Attn.: MARK SCHULTZ

Facility/Site: C/O GUARD OFFICE-SILVER ROAD Phone:

Address: HELLERTOWN, PA. 18055

SAMPLE IDENTIFICATION

Facility: C H A M P I O N (Facility/Site Code) (Optional Sample Point Descriptions)

Sample Point: W - C S P - 2 (Source Code (from below); Your Sample Point ID (left justify)) 11 10 86 (Start Date (YY/MM/DD)) 1 3 0 0 (Start Time (2400 hr. clock)) (Elapsed Hours (composite))

Source Codes:

Well ..(W) Outfall .....(O) Bottom Sediment ....(B) Surface Impoundment....(I) Leachate Collection Sys.....(C) Other .....(X)

Soil ..(S) River/Stream..(R) Generation Point ....(G) Treatment Facility .....(T) Lake/Ocean .....(L) Specify

86/11/10 MB 86/11/13

SHUTTLE CONTENTS

BOTTLE				ANALYSIS	SAMPLER		LAB
No	Type	Size	Preserv.		Filt. (Y/N)	Observations	Observations
1	M	500 ML	HNO3	METALS			✓
1	PN	125 ML	H2SO4	PHENOLS			✓
1	B	125 ML	H2SO4	NITRATE			✓
1	CN	125 ML	NAOH	CYANIDE			✓
1	A	500 ML	BAKED	SOLIDS, TD/SULFATE			✓
1	D	500 ML	DI RINSE	FLUORIDE			✓
2	V	40 ML	SOD. THIOL.	VOA			VI-BUB

CHAIN OF CUSTODY CHRONICLE

1. Shuttle Opened By: (print) M. SCHULTZ Date: 11-10-86 Time:
   Signature: Mark Schultz Seal #: Intact:

2. I have received these materials in good condition from the above person.
   Name: Signature:
   Date: Time: Remarks:

3. I have received these materials in good condition from the above person.
   Name: Signature:
   Date: Time: Remarks:

Shuttle Sealed By: (print) M. SCHULTZ Date: 11-10-86 Time: 16:30

Signature: Mark Schultz Seal #: 067754 Intact:

LAB USE ONLY Opened By: Frank Schstadt Date: 11/11/86 Time: 5:22PM

SHUTTLE # 381 TEMP. °C 12 SEAL # 67754 COND. INTACT

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ETC ENVIRONMENTAL TESTING and CERTIFICATION

FIELD PARAMETER FORM (CC2)

ETC JOB # P4851

Sample Point [W] [CISIP1-12] (Source Code / Sample Point I D)

FIELD PROCEDURES

PURGE DATE (YY MM DD) | START PURGE (2400 Hr Clock) | ELAPSED HRS | WATER VOL. IN CASING (Gallons) | VOLUME PURGED (Gallons)

SAMPLING METHOD: _____

Sampler Type [ ] A-Submersible Pump, B-ISCO, C-Bladder Pump, D-Dipper/Bottle, E-Bailer, F-Scoop/Shovel, X-Other _____ (SPECIFY OTHER)

Sampler Material [ ] A-Teflon, B-Metal, C-PVC, D-Plastic, X-Other _____ (SPECIFY OTHER)

Tubing Material [ ] A-Teflon, B-Tygon, C-Polyethylene, D-Silicon, X-Other _____ (SPECIFY OTHER)

Sample Composited [Y/N] _____ Procedure/Proportions

FIELD MEASUREMENTS

Well Elevation (ft/msl) _____ Well Depth (ft) _____

Depth to Ground water (ft) _____ Sample Depth (non-well) (ft) _____

Groundwater Elevation (ft msl) _____

	ph	(STD)	spec. cond.	um/cm at 25° C	(other parameter)	value	units
1st		(STD)		um/cm at 25°C			
2nd		(STD)		um/cm at 25°C			
3rd		(STD)		um/cm at 25°C			
4th		(STD)		um/cm at 25°C			

Sample Temp _____ (°C) Turbidity _____ NTU

FIELD COMMENTS

Sample Appearance: _____

Weather Conditions: _____

Other: _____

FILTERING: Use Chain of Custody (CC1) to indicate which bottles were filtered

Sampler: _____ (Print) Employer: _____

I certify that sampling procedures were in accordance with applicable EPA state and corporate protocols.

305176 _____ (Date) _____ (Signature)

ORIGINAL

ETC ENVIRONMENTAL TESTING and CERTIFICATION

LABORATORY CHRONICLE: GC-MS Department

DATE 861121 SHIFT
FRACTION VOA
INSTRUMENT M
TUNE FILE APETO2
SEQUENCE FILE 10M
METHOD FILE VOAM
ID FILE MVOA
ANALYST(S) J. Quinn, David Gallant
SUPERVISOR [signature]
BATCH #'s QV5931

STANDARD	CONC PPM	LOT NO.	LOT VOL.
p-BFB	50	13295	1
Internal Std E	25	13747	10
Surrogate	25	14671	10
ABC/XVOA	18	146644	5,10,30

(PLEASE INITIAL)

CURRENT CS05 STATUS		STANDARDS UPDATED	
ACQ		DATE	861126
WIP		BY	D. Gallant

NAME	DATA FILE	uL INJ	ALS #	DIL	TAPE #	SPECIALS (WRITE A-TYPE)	PLUS Y/N
p-BFB	>M7497	1 ul					
QC5931V	>M7498	5ml	1			06:18	
QC5931VS	>M7499	↓	2		CBUPD	5ul ABC/XVOA	
QC5931VS	>M7500		3		CBCAL	10ul ABC/XVOA	
QC5931VS	>M7501	↓	4			30ul ABC/XVOA 08:43	
p-BFB	>M7502	1ul			OK	09:32	
P4240VS	>M7503	5ml	1		OK		
P4240V	>M7504	↓	2		OK		
P4241VR	>M7505		3		OK		
P4241V	>M7506	↓	4		OK		
P4242V	>M7507	5ml	5		OK		
P4243V	>M7508		6		OK		
P4244V	>M7509		7		OK		
P4236V	>M7510		8		OK		
P4237V	>M7511	↓	9		OK		
② P4239V	>M7512	0.001	10	1:5000		Too Dilute Rerun 1:500	
p-BFB	>M7513	1ul					
QC5931VS	>M7514		10		OK	5ul ABC/XVOA	
② P4239V	>M7515	0.01	1	1:500	OK	For Benzene	
P4235V	>M7516	5ml	2		OK		
P5336V	>M7517		3		OK		
P5415V	>M7518	↓	4		OK		
P5414V	>M7519	0.1ml	5	1:50	OK		
P4850V	>M7520	5ml	6		OK		
P4851V	>M7521	↓	7		OK		

ETC FORM #102

ETC ENVIRONMENTAL TESTING and CERTIFICATION

LABORATORY CHRONICLE: GC-MS Department

DATE 861122 SHIFT
FRACTION VOA
INSTRUMENT 5 m
TUNE FILE BFB102
SEQUENCE FILE 10m
METHOD FILE voam
ID FILE mvoa
ANALYST(S) J Quinn
SUPERVISOR Stapleton
BATCH #'s QV5931

(PLEASE INITIAL)

CURRENT CS05 STATUS		STANDARDS UPDATED	
ACO		DATE	
WIP		BY	

STANDARD	CONC PPM	LOT NO.	
PAGE 2 of 2			

NAME	DATA FILE	uL INJ	ALS #	DIL	TAPE #	SPECIALS (WRITE A-TYPE)	P
P4852V	>m7522	5ml	8		OK		
P4853V	>m7523	↓	9		NG	rerun carryover	
			~~50~~				

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ETC ENVIRONMENTAL TESTING and CERTIFICATION

CONVENTIONAL CHEMISTRY LAB

ANALYZED ON: 11/26/86

TEST: Fluoride, UNITS: mg/L,
METH. REF. # STD METHOD 413E, MDL: 0.10,
INSTRUMENT # A.A. Channel 7,

BY: Cyberlab
BOOK # CV-12 P. 108
FROM PAGE # 107

Log Link	Job #	Analyzed Conc.	Dilu	Reported Conc.
17455	M0831	0.07	-	BmDL
17455	M0703	0.26	10x	2.60
17455	M0704	0.27	10x	2.70
17455	M0705	0.23	10x	2.30
17455	M0706	0.28	10x	2.80
17455	M0707	0.23	10x	2.30
17455	M0708	.003	-	BmDL
17514	FluO32 ~~M0832~~	0.44	-	0.44
17514	FluO33 ~~M0833~~	0.54	-	0.54
17749	P2500	0.01	-	BmDL
17749	P2513	0.07	-	BmDL
17749	P2514	0.03	-	BmDL
17749	P2515	0.07	-	BmDL
17749	P2526	0.04	-	BmDL
17778	P2497	0.03	-	BmDL
17778	P2499	0.03	-	BmDL
17778	P2507	0.13	-	0.13
17778	P2517	0.12	-	0.12
17798	P2469	0.03	-	BmDL
17798	P2477	0.05	-	BmDL
17798	P2524	0.08	-	BmDL
17798	P2538	0.05	-	BmDL
17798	P2539	0.04	-	BmDL
17798	P2540	0.02	-	BmDL

Log Link	Job #	Analyzed Conc	Dilu	Reported Conc
17828	P2472	0.03	-	BmDL
17828	P2473	0.03	-	BmDL
17828	P2522	0.08	-	BmDL
17828	P2536	0.03	-	BmDL
17828	P2548	0.02	-	BmDL
17866	P4850	0.16	-	0.16
17866	P4851	0.21	-	0.21
17866	P4852	2.24	-	RPT
17866	P4853	0.98	-	0.98
17250	NO520	1.64	-	1.64
17441	P2737	0.07	-	BmDL
17878	P2776	0.087	-	BmDL
17864	P2481	.006	-	BmDL
17864	P2531	0.02	-	BmDL
17864	P2541	0.04	-	BmDL
17864	P2546	0.02	-	BmDL
17864	P2554	0.01	-	BmDL

STANDARDS

PREPED ON _____
BY _____
FROM _____ mg/L
STOCK# _____

STANDARD mg/L	VALUE OBTAINED	% of Theoretical

SLOPE	Intercept	Corr. Coef.

ADDITIONAL COMMENTS

RPT:
NO519 - 1 over 2 min
P4852 - 1 and 1 over 5 in instrument mix
Dilute 1:10 and check

Analyses QA/QC Data Report

See CV-12, P 107.

QC Batch # FL001 + FL003

Verified: [signature] 11/28/86

METHOD BLANK		
Spiked Blank (Known)		
Spiked Blank Result		
% Recovery		
EXTERNAL REF. QC		
Known Value		
Observed Result		
% Recovery		

PRECISION	
Job # Dup (ETC)	P2472
Original Result	.0297
Duplicate Result	.0339
R Range	.0042
ACCURACY	
Job # Spiked (ETC)	P2472
Original Result	.0313
Amount Spiked	1.00
Spiked 'S' Result	1.07
% Recovery	104 %

To Page No. _____

ETC ENVIRONMENTAL TESTING and CERTIFICATION

CONVENTIONAL CHEMISTRY LAB

ANALYZED ON: 11-21-86

TEST: NITRATE, UNITS: mg/l,

METH. REF. # 353.2, MDL: 0.10, x7

INSTRUMENT # #1 (Channel 1),

BY: CH

BOOK # CV-12 P. 97

FROM PAGE # 96

Log Lnk	Job #	Analyzed Conc.	Dilu	Reported Conc.
7514	N6032	.334	5X	1.67
7514	N6033	.0134	5X	Redo
7562	N6122	.804	5X	4.02
7503	P2683	.0213	5X	Redo
7798	P2469	.276	10X	2.76
7798	P2477	1.54	10X	15.4
17798	P2524	.517	10X	5.17
17798	P2538	.583	10X	5.83
17796	P2539	.856	10X	8.56
17798	P2540	.618	10X	6.18
~~7814~~	~~P3555~~	~~.101~~	~~10X~~	
17822	P3107	.417	10X	4.17
~~7822~~	~~P3112~~	~~.0189~~	~~10X~~	
17828	P2473	.442	10X	4.42
17828	P2472	.547	10X	5.47
17828	P2522	.417	10X	4.17
17828	P2536	.435	10X	4.35
7828	P2548	.525	10X	5.25
~~7864~~	~~P2491~~	~~.0142~~	~~10X~~	
~~7864~~	~~P2521~~	~~.0158~~	~~10X~~	
~~7864~~	~~P2541~~	~~.116~~	~~10X~~	~~1.60~~
17864	P2546	.694	10X	6.94
~~17864~~	~~P2537~~	~~.196~~	~~10X~~	~~1.98~~
17866	P4850	.550	10X	5.50

Log Lnk	Lab #	Analyzed Conc	Dilu	Reported Conc
17866	P4851	.793	10X	7.93
~~17866~~	~~P4852~~	~~.487~~	~~10X~~	
17866	P4853	.442	10X	4.42
~~17838~~	~~P4976~~	~~.0142~~	~~10X~~	
~~17886~~	~~P5117~~	~~.153~~	~~10X~~	~~1.53~~
~~17886~~	~~P5120~~	~~.0195~~	~~10X~~	
~~17886~~	~~P5122~~	~~.0211~~	~~10X~~	
~~17886~~	~~P5124~~	~~.0229~~	~~10X~~	
~~17886~~	~~P5126~~	~~.0176~~	~~10X~~	
17882	P2543	.528	10X	5.28
~~17882~~	~~P2544~~	~~.0253~~	~~10X~~	
17882	P2545	1.33	10X	13.3
17882	P2547	1.44	10X	14.4
17882	P2549	.924	10X	9.24
17882	P2550	.401	10X	4.01
17882	P2551	1.03	10X	10.3
17882	P2552	.717	10X	7.17

STANDARDS

PREPED ON _____

BY _____

FROM _____ mg/L

STOCK # _____

STANDARD mg/L	VALUE OBTAINED	% of Theoretical

SLOPE	Intercept	Corr. Coef.

ADDITIONAL COMMENTS

Straight Red Line Through Samples Done on Channel 2 No Dilution Page 98

Rpt N6033 } straight
P2683 }

Analyses QA/QC Data Report

QC Batch # N3003 & N3004

Verified: 11/24/86

METHOD BLANK			
Spiked Blank (Known)			
Spiked Blank Result			
% Recovery			
EXTERNAL REF. QC			
Known Value			
Observed Result			
% Recovery			

PRECISION							
Job # Dup (ETC)							
Original Result							
Duplicate Result							
R Range							
ACCURACY							
Job # Spiked (ETC)							
Original Result							
Amount Spiked							
Spiked $ Result							
% Recovery							

To Page No. _____

ETC ENVIRONMENTAL TESTING and CERTIFICATION

CONVENTIONAL CHEMISTRY LAB

TEST: Nitrite, UNITS: mg/l, ANALYZED ON: 11-22-86

METH. REF. # 353.2, MDL: 0.10, BY: S.T.

INSTRUMENT # #1 (Channel 2), BOOK # CV-12 P. 100

39 FROM PAGE # ____

LogLink	Job #	ANALYZED CONC.	Dilu	REPORTED CONC.
17524	N6110	0		BMDL
17524	N6120	.0028		BMDL
17529	N6126	.0040		BMDL
17531	P2710	.0024		BMDL
17531	P2725	0		BMDL
17539	P2117	.0043		BMDL
17539	P2116	.0954		BMDL
17539	P2119	.0571		BMDL
17524	P1711	.0043		BMDL
17524	P1713	.0040		BMDL
17524	P1714	0		BMDL
17524	P1717	.00119		BMDL
17562	N6128	0		BMDL
17562	N6148	.00119		BMDL
17573	P2717	0		BMDL
17579	P2726	.118		.12
17584	P3068	.100		.10
17503	P2683	.121		.12
17562	N6122	.00357		BMDL
17524	P1715	.00243		BMDL
17864	P2531	.00119		BMDL
17864	P2541	.0611		BMDL
17864	P2546	.0641		BMDL
17864	P2557	.00282		BMDL

LogLink	Item #	ANALYZED CONC	Dilu	REPORTED CONC
17866	P4850	.00151		BMDL
17866	P4851	.0166		BMDL
17866	P4852	.0490		BMDL
17866	P4853	.0446		BMDL
17878	P2776	.00181		BMDL
17866	P3120	.00114		BMDL
17866	P3122	0		BMDL
17866	P3124	.0164		BMDL
17866	P3126	0		BMDL
17882	P2543	.00471		BMDL
17882	P2544	.00213		BMDL
17882	P2545	.00773		BMDL
17882	P2547	.00784		BMDL
17882	P2549	.00119		BMDL
17886	P3117	.0066		BMDL

STANDARDS

PREPED ON ____

BY ____

FROM ____ mg/L

STOCK# ____

STANDARD mg/L	VALUE OBTAINED	% of Theoretical
1.00	.99	99 %
0.50	.51	102 %
0.20	.197	98.5 %
0.05	.046	92%

SLOPE	Intercept	Corr. Coef.
.0120	-.0005	.9998

ADDITIONAL COMMENTS

All Calculations By X=mY+B.

Analyses QA/QC Data Report

QC Batch # (W3004 NO2)

Verified: 11/24/86

PRECISION

METHOD BLANK	.00337	
Spiked Blank (Known)	.20	
Spiked Blank Result	198	
% Recovery	99	
EXTERNAL REF. QC	N/A	TDS
Known Value		.5
Observed Result		-531
% Recovery		

Job # Dup (ETC)	N6110	P1714					
Original Result	0	0					
Duplicate Result	0	.0015					
R Range	0.0	.0015					
ACCURACY							
Job # Spiked (ETC)		P1714					
Original Result		0					
Amount Spiked		.0282					
Spiked S' Result							
% Recovery		1.31					

To Page No. ____

ETC ENVIRONMENTAL TESTING and CERTIFICATION

CONVENTIONAL CHEMISTRY LAB

ANALYZED ON: 11-24-86

TEST: NITRATE, UNITS: mg/l,

METH. REF. # 353.2, MDL: 0.10, 37

INSTRUMENT # #1 (CHANNEL 2),

BY: CH

BOOK # CV-12 P. 98

FROM PAGE # ____

Lab Lnk	Job #	ANALYZED CONC.	DILN	REPORTED CONC.	Lab Lnk	Job #	ANALYZED CONC	DILN	REPORTED CONC
7798	P2469	over		*	17886	P3117	1.15		1.15
7798	P2471	over		*	17866	P3120	.0207		BMDL
7798	P2524	over		*	17866	P3122	.0511		BMDL
7798	P2538	over		*	17866	P3124	.0173		BMDL
7798	P2539	over		*	17866	P3126	.0127		BMDL
7798	P2540	over		*	17882	P2543	over		*
7814	P3555	.487	-	.49	17882	P2544	.0250		BMDL
7822	P3107	over		*	17882	P2545	over		*
17822	P3112	.007		BMDL	17882	P2547	over		*
17828	P2473	over		*	17882	P2549	over		*
7828	P2472	over		*	17882	P2550	over		*
17828	P2522	over		*	17882	P2551	over		*
17828	P2536	over		*	17882	P2552	over		*
17828	P2538	over		*					
7864	P2481	.006		BMDL					
17864	P2531	.0245		BMDL					
17864	P2541	1.73		1.73					
17864	P2546	over		*					
17864	P2554	2.06		2.06					
17866	P4850	over		*					
17866	P4851	over		*					
7866	P4852	.398		.40					
7866	P4853	over		*					
17878	P2770	.0462		BMDL					

STANDARDS

PREPD ON ____

BY ____

FROM ____ mg/L

STOCK# ____

STANDARD mg/L	VALUE OBTAINED	% of Theoretical
2.00	1.98	
1.00	1.04	
.50	.497	
.80	.0934	

SLOPE	Intercept	Corr. Coef.

ADDITIONAL COMMENTS

* RPT on CHANNEL 1 complete Page 97

Analyses QA/QC Data Report

QC Batch # NC003

Verified: 11/24/86

METHOD BLANK	.003	.0177
Spiked Blank (Known)	.5	.5
Spiked Blank Result	.501	.532
% Recovery	160%	1.06
EXTERNAL REF. QC	EPA	
Known Value	93	
Observed Result	.953	
% Recovery	1.02	

PRECISION

Job # Dup (ETC)	P2473	P4850	P3126			
Original Result	over	over	.0217			
Duplicate Result			.0194			
R Range						

ACCURACY

Job # Spiked (ETC)	P2473	P4850	P3126			
Original Result	over	over	.021			
Amount Spiked			.5			
Spiked S' Result			.506			
% Recovery			97%			

To Page No. ____

305182

ETC ENVIRONMENTAL TESTING and CERTIFICATION

CONVENTIONAL CHEMISTRY LAB

ANALYZED ON: 12-3

TEST: Cyanide, UNITS: mg/l,
METH. REF. #: 335.3, MDL: 0.025,
INSTRUMENT #: #1 (channel 1),

BY: C.M.
BOOK # CY-12 P. 119
FROM PAGE #: ____

Log Lnk	Job #	Analyzed Conc.	Dilu	Reported Conc.	Log Lnk	Job #	Analyzed Conc	Dilu	Reported Conc
17837	N4709	0		BmDL	17697	P4748	.005		BmDL
17837	N4714	0		BmDL	17697	P4748	.004		BmDL
17862	P0489	-.007		BmDL	17697	P4748	.004		BmDL
17863	P0493	-.009		BmDL	17698	P1710	.003		BmDL
17863	P0494	.005		BmDL	17701	N4710	.004		BmDL
17863	P0495	-.002		BmDL	17701	N4715	.004		BmDL
17866	P4850	.539		.539	17866	P4851	over		RBDo
17868	P4510	*		Redo	17866	P4852	over		RBDo
17878	P2776	.007		BmDL	17866	P4853	*		Redo
17881	P1865	.002		BmDL	17868	P4510	*		Redo
17883	N4706	.002		BmDL	17868	P4511	*		Redo
17883	N4711	.003		BmDL	17868	P4512	*		Redo
17833	P4241	.0197		BmDL	17868	P4513	*		Redo
17833	P4242	.0169		BmDL	17883	N4712	*		Redo
17833	P4243	.0211		BmDL	17883	N4713	*		Redo
17833	P4244	.0186		BmDL	17889	P2754	*		Redo
17834	P4248	.0185		BmDL	17869	P2761	*		Redo
17834	P4249	.0189		BmDL	17889	P2774	*		Redo
17834	P4250	.0231		BmDL	17889	P2775	*		Redo
17834	P4251	.0189		BmDL	17833	P4235	*		Redo
~~17834~~	~~P2774~~	~~.006~~		~~BmDL~~	17833	P4236	*		Redo
17693	P2916	.0185		BmDL	17833	P4237	*		Redo
17693	P2917	.0312		BmDL	17833	P4238	*		Redo
17697	P4748	.006		BmDL	17833	P4239	*		Redo

STANDARDS

PREPED ON: 12-2
BY: D.B.
FROM: ____ mg/L
STOCK #: ____

STANDARD mg/L	VALUE OBTAINED	% of THEORETICAL
.500	.493	98.6%
.400	.405	101.%
.200	.205	102.5%
.100	.102	102%

SLOPE	Intercept	Corr. Coef.

ADDITIONAL COMMENTS

* RPT DUE TO INSTRUMENTATION problem
P4851 10x
P4852 20x

Analyses QA/QC Data Report

QC Batch # CY003

Verified: 12/3/86

PRECISION

METHOD BLANK	.008	
Spiked Blank (Known)	.100	
Spiked Blank Result	.103	
% Recovery	103%	
EXTERNAL REF. QC	EPA	
Known Value	.224	
Observed Result	.228	
% Recovery	101.7%	

Job # Dup (ETC)	N4709	P4748				
Original Result	0	0.006				
Duplicate Result	0	0.005				
R Range	0.0	0.001				
ACCURACY						
Job # Spiked (ETC)	N4709					
Original Result	0.0					
Amount Spiked	.200					
Spiked S' Result	.201					
% Recovery	99%					

To Page No. ____

305183

ETC ENVIRONMENTAL TESTING and CERTIFICATION

CONVENTIONAL CHEMISTRY LAB

TEST: Phenol, UNITS: mg/l,
METH. REF. # 420.2, MDL: 0.050,
INSTRUMENT # AA Channel #1,

ANALYZED ON: 11/29/86
BY: L. Johnson / R. Hulit
BOOK # CV-12 P. 115
FROM PAGE # 114

Log Link	Job #	Analyzed Conc.	Dilu	Reported Conc.
17539	P2121	0.037	X10	.375
↓	P2123	0.043	STR	BMDL
17543	P4131	"	X10	RPT STR
17584	P3067	0.013	—	BMDL
17639	N9882	"	X5	RPT 1:100
17681	N9884	"	X5	RPT 1:100
↓	N9880	"	X5	RPT 1:100
↓	P2614	"	X5	STR/DUP RPT
17696	P0582	"	—	STR. RPT
17824	P4480	"	X5	RPT 1:10
17828	P2472	"	X5	RPT
17864	P253	"	X5	RPT
17868	P4512	"	X5	RPT
17886	P4851	0.067	X5	0.335
17864	P2554	0.017	—	BMDL
17886	P4851	0.013	—	BMDL
↓	P4852	0.017	—	BMDL
↓	P4853	0.022	—	BMDL
17886	P5124	0.128	X10	1.28
17707	N8072	0.048	—	BMDL
↓	N8075	0.027	—	BMDL
17721	N8074	0.131	X10	1.31
17749	P2508	0.031	—	BMDL
↓	P2513	0.096	X10	.964

Log Link	Job #	Analyzed Conc	Dilu	Reported Conc
17749	P2514	"		MATRIX RPT STR

STANDARDS

PREPED ON _____
BY _____
FROM _____ mg/l
STOCK # _____

STANDARD mg/L	VALUE OBTAINED	# of Titrants
.300		
.200		
.100		
.050		

SLOPE	Intercept	Corr. Coef

ADDITIONAL COMMENTS

Analyses QA/QC Data Report
SEE CV-12, P 114

QC Batch # PN003

Verified: [signature] 11/29/86

METHOD BLANK			
Spiked Blank (Known)			
Spiked Blank Result			
% Recovery			
EXTERNAL REF. QC			
Known Value			
Observed Result			
% Recovery			

PRECISION							
Job # Dup (ETC)							
Original Result							
Duplicate Result							
R Range							
ACCURACY							
Job # Spiked (ETC)							
Original Result							
Amount Spiked							
Spiked S' Result							
% Recovery							

To Page No. _____

ETC ENVIRONMENTAL TESTING and CERTIFICATION

CONVENTIONAL CHEMISTRY LAB

TEST: Phenol, UNITS: mg/l,
METH. REF. # 420.2, MDL: 0.050,
INSTRUMENT # AA Channel #1,

ANALYZED ON: 11/29/86
BY: L. Herrera / R. Hulit
BOOK # CV-12 P. 115
FROM PAGE # 114

Log Lnk	Job #	Analyzed Conc.	Dilu	Reported Conc.
17539	P2121	0.037	X10	.375
↓	P2123	0.043	STR	BMDL
17543	P4131	〃	X10	STR RPT
17584	P3067	0.013	-	BMDL
17639	N9882	〃	X5	1:100 RPT
17681	N9884	〃	X5	1:100 RPT
	N9880	〃	X5	1:150 RPT
↓	P2614	〃	X5	STR RPT
17696	P0582	〃	-	STR. RPT
17824	P4480	〃	X5	1:10 RPT
17828	P2472	〃	X5	RPT
17864	P2531	〃	X5	RPT
17868	P4512	〃	X5	RPT
17886	P4851	0.067	X5	0.335
17864	P2554	0.017	-	BMDL
17886	P4851	0.013	-	BMDL
	P4852	0.017	-	BMDL
↓	P4853	0.022	-	BMDL
17886	P5124	0.128	X10	1.28
17707	N8072	0.048	-	BMDL
↓	N8075	0.027	-	BMDL
17721	N8674	0.131	X10	1.31
17749	P2510	0.031	-	BMDL
↓	P2513	0.096	X10	.964

Log Lnk	Job #	Analyzed Conc	Dilu	Reported Conc
17749	P2514	〃		MATRIX RPT STR

STANDARDS

PREPED ON _____
BY _____
FROM _____ mg/L
STOCK # _____

STANDARD mg/L	VALUE OBTAINED	% of Theoretical
.300		
.200		
.100		
.050		

SLOPE	Intercept	Corr. Coef.

ADDITIONAL COMMENTS

Analyses QA/QC Data Report
SEE CV-12, P 114

QC Batch # PN003

Verified: [signature] 11/29/86

METHOD BLANK		
Spiked Blank (Known)		
Spiked Blank Result		
% Recovery		
EXTERNAL REF. QC		
Known Value		
Observed Result		
% Recovery		

PRECISION							
Job # Dup (ETC)							
Original Result							
Duplicate Result							
R Range							
ACCURACY							
Job # Spiked (ETC)							
Original Result							
Amount Spiked							
Spiked S' Result							
% Recovery							

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305185

ETC ENVIRONMENTAL TESTING and CERTIFICATION

CONVENTIONAL CHEMISTRY LAB

ANALYZED ON: 11/29/86

TEST: Phenol, UNITS: mg/L,
METH. REF. # AA/EPA 420.2, MDL: .050,
INSTRUMENT # AA Channel #2,

BY: D. Herman/R. Hurley
BOOK # CV-12 P. 11
FROM PAGE # ____

Log Link	Job #	ANALYZED CONC.	Dilu	REPORTED CONC.
17798	P2469	0.030	-	BMDL
	P2477	0.014	-	BMDL
	P2524	0.012	-	BMDL
	P2538	0.012	-	BMDL
	P2539	0.012	-	BMDL
	P2540	0.014	-	BMDL
17799	P2393	0.038	-	BMDL
	P2394	0.028	-	BMDL
17801	P4467	0.004	-	BMDL
17823	P4724	0.002	-	BMDL
17824	P4480	~	-	RPT
17828	P2472	0.028	-	BMDL
	P2473	0.017	-	BMDL
	P2522	0.017	-	BMDL
	P2536	0.025	-	BMDL
	P2548	0.015	-	BMDL
17837	P4709	0.015	-	BMDL
	P4714	0.023	-	BMDL
17864	P2481	0.025	-	BMDL
	P2531	0.0106	-	BMDL
	P2541	0.030	-	BMDL
	P2546	0.017	-	BMDL
	P2554		-	RPT
17866	P4850	0.321	-	RPT

Log Link	Job #	ANALYZED CONC	Dilu	REPORTED CONC
17866	P4851	~	-	RPT
	P4852	~	-	RPT
	P4853	~	-	RPT
17868	P4510	0.076	-	.076
	P4511	0.054	-	.054
	P4512	0.056	-	.056
	P4513	0.017	-	BMDL
17878	P2776	0.015	-	BMDL
17886	P3120	0.027	-	BMDL
	P3122	0.010	-	BMDL
	P3124	~	-	OFF SCALE RPT
	P3126	0.084	-	.084
17882	P2543	0.036	-	BMDL
	P2544	0.060	-	.060
	P2545	0.051	-	.051
	P2547	0.017	-	BMDL
	P2549	0.015	-	BMDL
	P2550	0.021	-	BMDL
	P2551	0.031	-	BMDL
	P2552	0.021	-	BMDL

STANDARDS

PREPED ON ____
BY ____
FROM ____ mg/L
STOCK # ____

STANDARD mg/L	VALUE OBTAINED	% of Theoretical
[illegible]	PKH	
.350	85.5	~~85.5%~~
.200	63.5	~~63.5%~~
.100	33.5	~~33.5%~~
.050	18.5	~~18.5%~~

SLOPE	Intercept	Corr. Coef.
270.169	6.3474	0.99719

ADDITIONAL COMMENTS

P4480 - matrix interference
P2554 - " " "
P4850 - RPT for dilution
P4851 -
P4852 -
P4853 -
P3124 -
ALL CALCS BY X=MY+B.

Analyses QA/QC Data Report

QC Batch # PH004

Verified: 11/29/86

METHOD BLANK	0.019	
Spiked Blank (Known)	.050	.100
Spiked Blank Result	0.045	0.095
% Recovery	90%	95%
EXTERNAL REF. QC	NOT ANALYZED	
Known Value		
Observed Result		
% Recovery		

PRECISION

Job # Dup (ETC)	P2469	P4480	P3120	P2551		
Original Result	0.030	matrix	0.028	0.036		
Duplicate Result	0.030		0.026	0.026		
R Range		Inter-	0.002	0.010		
ACCURACY		ference				
Job # Spiked (ETC)	P2469		P3120	P2551		
Original Result	0.030	(CH)	0.027	0.031		
Amount Spiked	0.100		.100	.100		
Spiked S' Result	0.123		0.117	0.130		
% Recovery	91.2		90%	99%		

305185

To Page No. K

ETC ENVIRONMENTAL TESTING and CERTIFICATION

LOG LINK 17866

LABORATORY CHRONICLE: Metals Department

Samples P4850 - P4853

	Chemist	Date
Hg Prep	—	—
AA Prep	—	—
ICAP Prep	[illegible]	11/24/86

Lab Supervisor Joan Komarek Date 11/28/86

ETC FORM #101

SUBCONTRACT
REQUEST FOR ANALYSIS
and SAMPLE CHAIN OF CUSTODY

LOGLINK: 17866

MATRIX: WATER

NAME OF SUBCONTRACT LAB: CHYUN

ETC JOB NUMBERS: P4850 P4853
P4851
P4852

TURNAROUND IN DAYS: NORMAL DATE DATA REQUIRED: 11/22
(If deadline cannot be met, contact ETC Subcontract Group).

Send invoice, bill and reports to : ETC Subcontract Group
(201)225-6786

Please perform the analyses requested below:

___ Acidity	___ Alkalinity	___ Ammonia(probe)
___ Ammonia(dist)	___ Bicarbonate	___ BOD(5 day)
___ Bromide	___ Carbonate	___ Chloride
___ Chem.Oxygen Dem.	___ Chromium+6	___ Fecal Coliform
___ Total Coliform	___ Color,apparent	___ Cyanide,total
___ Fluoride	___ Formaldehyde(UV)	___ Hardness
___ Nitrate(NO3)	___ Nitrite(NO2)	___ TKN
___ Odor	___ Oil & Grease(grav)	___ T.Organic Carb.
___ Pet.Hydro(IR)	___ Pet.Hydro(grav)	___ Phenolics,tot.
___ Phenolics(5ug/l)	___ Phosphate(ortho)	___ Phospate(total)
___ Phosphorus(tot.)	___ Silica(dissolved)	X Sulfate(SO4)
___ Sulfide(S)	___ Sulfite(SO3)	___ Surfactant(MBAS
___ Solids,Total	___ Solids,Tot. Diss.	___ Solids,Tot.Set.
X Solids,Tot. Sus.	___ Solids,Tot. Vol.	___ Turbidity
___ Gross Alpha,Beta	___ Radium 226	___ Radium 228

Others: _____

Chain of Custody Section for Courier Pick up at ETC

Sample(s) Relinquished by:(ETC) Jack Ickstadt
Time: 4:30pm Date: 11/13/86
Sample(s) Received by: Mark Kelly
Time: 4:30pm Date: 11/12/86

Chain of Custody Section for Sending Sample from ETC

Sample Shuttle sealed by : _____
Date: ___/___/___ Time: _____ Seal Number: _____

Sample Shuttle opened by : _____
Date: ___/___/___ Time: _____ Seal Number: _____
Was the Seal intact? _____ Are the shuttle contents in good condition? _____

Chain of Custody Section for Returning Sample to ETC

Sample Shuttle sealed by: _____
Date: ___/___/___ Time: _____ Seal Number: _____

Sample Shuttle opened by : _____
Date: ___/___/___ Time: _____ Seal Number: _____
Was the Seal intact? _____ Are the shuttle contents in good condition? _____

305188

Technical Report

for

ENVIRONMENTAL STRATEGIES CORP.

WASHINGTON HARBOUR

3050 KK ST. SUITE 325

WASHINGTON, DC 20007

Chain of Custody Data Required for ETC Data Management Summary Reports

ETC Sample No.	Company	Facility	Sample Point	Date	Time	Elapsed Hours
P4852	ENVIRONMENTAL STRATEGIES CORP.	CHAMPION	WCSP-3	861110	1400	

John J. Fitzgerald

Vice President
Research and Operations

This Technical Report is an INSITE℠ service generated by LODESTAR℠ Data Management Software.

TABLE OF CONTENTS

Introduction

This report contains the analytical results on your sample. It is designed to include comprehensive data from the entire analytical process in order to satisfy the needs of various levels of review.

The results obtained from your sample are presented in tabular format immediately following this introduction. Quality assurance data is tabulated along with the appropriate sample results for verification. Depending on the analyses ordered, the quality assurance data may include results from blank, spiked blank, spiked sample (i.e. matrix spike) and replicate sample as well as results from surrogate compound analyses. Quality assurance data for verification of proper instrument performance is also included where appropriate. The report appendices include the chain of custody record for your sample and, where appropriate, the gas chromatograms and mass spectra.

The procedures used in the analysis of the sample are described in this report's methodology section. All analytical procedures within our laboratory are performed within a strictly enforced Quality Assurance Protocol. A description of this Protocol is included in the report.

Results

Sample results, and associated quality assurance data, are always tabulated in one or more of this report's Quantitative Results Tables. The format of each table varies with the class of analysis.

Priority Pollutants

The priority pollutant compounds and elements are listed with their NPDES (National Pollution Discharge Elimination System) numbers, and the Method Detection Limit (MDL) published in the Federal Register. When a compound or element is present below its published MDL it is reported as BMDL (Below Method Detection Limit). When a compound or element is not present at any detectable concentrations it is reported as ND (Not Detected). MDL's for non-aqueous matrices are based on USEPA published MDL's but are adjusted as per sample weight. Matrix spike and replicate analyses, where included, were performed on samples randomly chosen within each quality assurance batch and are therefore not necessarily spikes and replicates of this report's sample. Surrogate compound recovery data and instrument calibration data are included in the Method Performance Data Tables.

ETC ENVIRONMENTAL TESTING and CERTIFICATION

NOV 26, 1986

TABLE 1: QUANTITATIVE RESULTS and QUALITY ASSURANCE DATA

Volatile Compounds – GC/MS Analysis Data (QR01)

Chain of Custody Data Required for ETC Data Management Summary Reports

ETC Sample No.	Company	Facility	Sample Point	Date	Time	Elapsed Hours
P4852	ENVIRONMENTAL STRATEGIES CORP.	CHAMPION	WCSP-3	861110	1400	

NPDES Number	Compound (Acrolein and Acrylonitrile values are screen only.)	Results		QC Replicate		QC Blank and Spiked Blank			QC Matrix Spike		
		Sample Concen. ug/l	MDL ug/l	First ug/l	Second ug/l	Blank Data ug/l	Concen. Added ug/l	% Recov	Unspiked Sample ug/l	Concen. Added ug/l	% Recov
1V	Acrolein	ND	100	ND	ND	ND	800	88	ND	800	98
2V	Acrylonitrile	ND	100	ND	ND	ND	80.0	94	ND	80.0	84
3V	Benzene	ND	4.4	ND	ND	ND	18.0	99	ND	18.0	100
4V	bis(Chloromethyl)ether	ND	10	ND	ND	ND	0	-	ND	0	-
5V	Bromoform	ND	4.7	ND	ND	ND	18.0	92	ND	18.0	90
6V	Carbon tetrachloride	ND	2.8	ND	ND	ND	18.0	103	ND	18.0	98
7V	Chlorobenzene	ND	6.0	ND	ND	ND	18.0	99	ND	18.0	99
8V	Chlorodibromomethane	ND	3.1	ND	ND	ND	18.0	99	ND	18.0	95
9V	Chloroethane	ND	10	ND	ND	ND	18.0	103	ND	18.0	96
10V	2-Chloroethylvinyl ether	ND	10	ND	ND	ND	18.0	0[A]	ND	18.0	0[A]
11V	Chloroform	ND	1.6	ND	ND	ND	18.0	103	ND	18.0	98
12V	Dichlorobromomethane	ND	2.2	ND	ND	ND	18.0	100	ND	18.0	96
13V	Dichlorodifluoromethane	ND	10	ND	ND	ND	18.0	109	ND	18.0	104
14V	1,1-Dichloroethane	5.88	4.7	ND	ND	ND	18.0	100	ND	18.0	99
15V	1,2-Dichloroethane	ND	2.8	ND	ND	ND	18.0	104	ND	18.0	96
16V	1,1-Dichloroethylene	3.44	2.8	ND	ND	ND	18.0	101	ND	18.0	97
17V	1,2-Dichloropropane	ND	6.0	ND	ND	ND	18.0	98	ND	18.0	101
18V	cis-1,3-Dichloropropylene	ND	5.0	ND	ND	ND	18.0	97	ND	18.0	100
19V	Ethylbenzene	ND	7.2	ND	ND	ND	18.0	100	ND	18.0	100
20V	Methyl bromide	ND	10	ND	ND	ND	18.0	103	ND	18.0	109
21V	Methyl chloride	ND	10	ND	ND	ND	18.0	107	ND	18.0	109
22V	Methylene chloride	ND	2.8	209	206	3.93	18.0	98	45.0	18.0	89
23V	1,1,2,2-Tetrachloroethane	ND	6.9	ND	ND	ND	18.0	101	ND	18.0	106
24V	Tetrachloroethylene	ND	4.1	ND	ND	ND	18.0	98	ND	18.0	103
25V	Toluene	ND	6.0	ND	ND	ND	18.0	100	ND	18.0	102
26V	1,2-Trans-dichloroethylene	1040	1.6	ND	ND	ND	18.0	97	ND	18.0	99
27V	1,1,1-Trichloroethane	5.33	3.8	ND	ND	ND	18.0	104	ND	18.0	97
28V	1,1,2-Trichloroethane	ND	5.0	ND	ND	ND	18.0	104	ND	18.0	100
29V	Trichloroethylene	167	1.9	ND	ND	ND	18.0	93	ND	18.0	87
30V	Trichlorofluoromethane	ND	10	ND	ND	ND	18.0	105	ND	18.0	99
31V	Vinyl chloride	513	10	ND	ND	ND	18.0	110	ND	18.0	99
18V	trans-1,3-Dichloropropylene	ND	10	ND	ND	ND	18.0	94	ND	18.0	96

[A] Recovery normally variable using established methodology.

ETC ENVIRONMENTAL TESTING and CERTIFICATION

NOV 29, 1986

TABLE 1: QUANTITATIVE RESULTS and QUALITY ASSURANCE DATA

Acid Compounds - GC/MS Analysis Data (QR02)

Chain of Custody Data Required for ETC Data Management Summary Reports

ETC Sample No.	Company	Facility	Sample Point	Date	Time	Elapsed Hours
P4852	ENVIRONMENTAL STRATEGIES CORP.	CHAMPION	WCSP-3	861110	1400	

NPDES Number	Compound	Results		QC Replicate		QC Blank and Spiked Blank			QC Matrix Spike		
		Sample Concen. ug/l	MDL ug/l	First ug/l	Second ug/l	Blank Data ug/l	Concen. Added ug/l	% Recov	Unspiked Sample ug/l	Concen. Added ug/l	% Recov
1A	2-Chlorophenol	ND	3.5	ND	ND	ND	100	89	ND	102	107
2A	2,4-Dichlorophenol	ND	2.9	ND	ND	ND	100	92	ND	102	100
3A	2,4-Dimethylphenol	ND	2.9	ND	ND	ND	100	18[a]	ND	102	3[a]
4A	4,6-Dinitro-o-cresol	ND	26	ND	ND	ND	100	92	ND	102	90
5A	2,4-Dinitrophenol	ND	45	ND	ND	ND	100	77	ND	102	88
6A	2-Nitrophenol	ND	3.9	ND	ND	ND	100	80	ND	102	89
7A	4-Nitrophenol	ND	2.6	ND	ND	ND	100	85	ND	102	97
8A	p-Chloro-m-cresol	ND	3.2	ND	ND	ND	100	77	ND	102	68
9A	Pentachlorophenol	ND	3.9	ND	ND	ND	100	74	ND	102	82
10A	Phenol	ND	1.6	ND	ND	ND	100	89	ND	102	109
11A	2,4,6-Trichlorophenol	ND	2.9	ND	ND	ND	100	89	ND	102	94

[a] Recovery normally variable using established methodology.

ETC ENVIRONMENTAL TESTING and CERTIFICATION

NOV 30, 1986

TABLE 1: QUANTITATIVE RESULTS and QUALITY ASSURANCE DATA

BASE/NEUTRAL COMPOUNDS - GC/MS ANALYSIS DATA (QR03)

Chain of Custody Data Required for ETC Data Management Summary Reports

ETC Sample No.	Company	Facility	Sample Point	Date	Time	Elapsed Hours
P4852	ENVIRONMENTAL STRATEGIES CORP.	CHAMPION	WCSP-3	861110	1400	

NPDES Number	Compound	Results		QC Replicate		QC Blank and Spiked Blank			QC Matrix Spike		
		Sample Concen. ug/l	MDL ug/l	First ug/l	Second ug/l	Blank Data ug/l	Concen. Added ug/l	% Recov	Unspiked Sample ug/l	Concen. Added ug/l	% Recov
1B	Acenaphthene	ND	2.0	ND	ND	ND	100	87	ND	102	87
2B	Acenaphthylene	ND	3.8	ND	ND	ND	100	90	ND	102	92
3B	Anthracene	ND	2.0	ND	ND	ND	100	84	ND	102	86
4B	Benzidine	ND	47	ND	ND	ND	100	0[a]	ND	102	3[a]
5B	Benzo(a)anthracene	ND	8.4	ND	ND	ND	100	89	ND	102	90
6B	Benzo(a)pyrene	ND	2.7	ND	ND	ND	100	98	ND	102	99
7B	Benzo(b)fluoranthene	ND	11	ND	ND	ND	100	109	ND	102	105
8B	Benzo(ghi)perylene	ND	4.4	ND	ND	ND	0	-	ND	0	-
9B	Benzo(k)fluoranthene	ND	3.8	ND	ND	ND	100	78	ND	102	87
10B	bis(2-Chloroethoxy)methane	ND	5.7	ND	ND	ND	100	80	ND	102	83
11B	bis(2-Chloroethyl) ether	ND	6.1	ND	ND	ND	100	87	ND	102	89
12B	bis(2-Chloroisopropyl)ether	ND	6.1	ND	ND	ND	100	88	ND	102	92
13B	bis(2-Ethylhexyl)phthalate	ND	11	ND	ND	ND	100	92	ND	102	93
14B	4-Bromophenyl phenyl ether	ND	2.0	ND	ND	ND	100	99	ND	102	95
15B	Butyl benzyl phthalate	ND	11	ND	ND	ND	100	75	ND	102	78
16B	2-Chloronaphthalene	ND	2.0	ND	ND	ND	100	87	ND	102	85
17B	4-Chlorophenyl phenyl ether	ND	4.5	ND	ND	ND	100	87	ND	102	91
18B	Chrysene	ND	2.7	ND	ND	ND	100	88	ND	102	88
19B	Dibenzo(a,h)anthracene	ND	11	ND	ND	ND	0	-	ND	0	-
20B	1,2-Dichlorobenzene	ND	2.0	ND	ND	ND	100	76	ND	102	76
21B	1,3-Dichlorobenzene	ND	2.0	ND	ND	ND	100	67	ND	102	72
22B	1,4-Dichlorobenzene	ND	4.7	ND	ND	ND	100	71	ND	102	75
23B	3,3'-Dichlorobenzidine	ND	18	ND	ND	ND	100	52	ND	102	54
24B	Diethyl phthalate	ND	11	ND	ND	ND	100	45	ND	102	48
25B	Dimethyl phthalate	ND	11	ND	ND	ND	100	22[a]	ND	102	18[a]
26B	Di-n-butyl phthalate	ND	11	ND	ND	BMDL	100	63	ND	102	61
27B	2,4-Dinitrotoluene	ND	6.1	ND	ND	ND	100	81	ND	102	110
28B	2,6-Dinitrotoluene	ND	2.0	ND	ND	ND	100	94	ND	102	106
29B	Di-n-octyl phthalate	ND	11	ND	ND	ND	100	101	ND	102	103
30B	1,2-Diphenylhydrazine	ND	11	ND	ND	ND	100	88	ND	102	96
31B	Fluoranthene	ND	2.4	ND	ND	ND	100	70	ND	102	58
32B	Fluorene	ND	2.0	ND	ND	ND	100	88	ND	102	95

NOV 30, 1986

TABLE 1: QUANTITATIVE RESULTS and QUALITY ASSURANCE DATA

BASE/NEUTRAL COMPOUNDS - GC/MS ANALYSIS DATA (QR03)

Chain of Custody Data Required for ETC Data Management Summary Reports

ETC Sample No.	Company	Facility	Sample Point	Date	Time	Elapsed Hours
P4852	ENVIRONMENTAL STRATEGIES CORP.	CHAMPION	WCSP-3	861110	1400	

NPDES Number	Compound	Results		QC Replicate		QC Blank and Spiked Blank			QC Matrix Spike		
		Sample Concen. ug/l	MDL ug/l	First ug/l	Second ug/l	Blank Data ug/l	Concen. Added ug/l	% Recov	Unspiked Sample ug/l	Concen. Added ug/l	% Recov
33B	Hexachlorobenzene	ND	2.0	ND	ND	ND	100	93	ND	102	94
34B	Hexachlorobutadiene	ND	.97	ND	ND	ND	100	71	ND	102	75
35B	Hexachlorocyclopentadiene	ND	11	ND	ND	ND	0	-	ND	0	-
36B	Hexachloroethane	ND	1.7	ND	ND	ND	100	62	ND	102	63
37B	Indeno(1,2,3-c,d)pyrene	ND	5.1	ND	ND	ND	0	-	ND	0	-
38B	Isophorone	ND	2.4	ND	ND	ND	100	76	ND	102	80
39B	Naphthalene	ND	1.7	ND	ND	ND	100	80	ND	102	84
40B	Nitrobenzene	ND	2.0	ND	ND	ND	100	89	ND	102	88
41B	N-Nitrosodimethylamine	ND	11	ND	ND	ND	0	-	ND	0	-
42B	N-Nitrosodi-n-propylamine	ND	11	ND	ND	ND	100	65	ND	102	85
43B	N-Nitrosodiphenylamine	ND	2.0	ND	ND	ND	100	83	ND	102	110
44B	Phenanthrene	ND	5.8	ND	ND	ND	100	89	ND	102	89
45B	Pyrene	ND	2.0	ND	ND	ND	100	69	ND	102	55
46B	1,2,4-Trichlorobenzene	ND	2.0	ND	ND	ND	100	158a	ND	102	152a

a Recovery normally variable using established methodology.

ETC ENVIRONMENTAL TESTING and CERTIFICATION

NOV 30, 1986

TABLE 1: QUANTITATIVE RESULTS and QUALITY ASSURANCE DATA

Pesticide/PCB Compounds - GC/MS Analysis Data (QR04)

Chain of Custody Data Required for ETC Data Management Summary Reports

ETC Sample No.	Company	Facility	Sample Point	Date	Time	Elapsed Hours
P4852	ENVIRONMENTAL STRATEGIES CORP.	CHAMPION	WCSP-3	861110	1400	

NPDES Number	Compound	Results		QC Replicate		QC Blank and Spiked Blank			QC Matrix Spike		
		Sample Concen. ug/l	MDL ug/l	First ug/l	Second ug/l	Blank Data ug/l	Concen. Added ug/l	% Recov	Unspiked Sample ug/l	Concen. Added ug/l	% Recov
1P	Aldrin	ND	2.0	ND	ND	ND	100	89	ND	102	55
2P	Alpha-BHC	ND	11	ND	ND	ND	100	39	ND	102	34
3P	Beta-BHC	ND	4.7	ND	ND	ND	100	57	ND	102	67
4P	Gamma-BHC	ND	11	ND	ND	ND	100	34	ND	102	32
5P	Delta-BHC	ND	3.3	ND	ND	ND	100	46	ND	102	44
6P	Chlordane	ND	11	ND	ND	ND	200	69	ND	204	56
7P	4,4'-DDT	ND	3.0	ND	ND	ND	100	72	ND	102	36
8P	4,4'-DDE	ND	6.0	ND	ND	ND	100	84	ND	102	47
9P	4,4'-DDD	ND	5.1	ND	ND	ND	100	71	ND	102	46
10P	Dieldrin	ND	2.7	ND	ND	ND	100	83	ND	102	82
11P	Endosulfan I	ND	11	ND	ND	ND	100	29	ND	102	11[a]
12P	Endosulfan II	ND	11	ND	ND	ND	100	30	ND	102	8[a]
13P	Endosulfan sulfate	ND	6.0	ND	ND	ND	100	44	ND	102	44
14P	Endrin	ND	11	ND	ND	ND	100	74	ND	102	72
15P	Endrin aldehyde	ND	11	ND	ND	ND	100	29	ND	102	30
16P	Heptachlor	ND	2.0	ND	ND	ND	100	97	ND	102	68
17P	Heptachlor epoxide	ND	2.4	ND	ND	ND	100	86	ND	102	106
18P	PCB-1242	ND	39	ND	ND	ND	0	-	ND	0	-
19P	PCB-1254	ND	39	ND	ND	ND	0	-	ND	0	-
20P	PCB-1221	ND	39	ND	ND	ND	0	-	ND	0	-
21P	PCB-1232	ND	39	ND	ND	ND	0	-	ND	0	-
22P	PCB-1248	ND	39	ND	ND	ND	0	-	ND	0	-
23P	PCB-1260	ND	39	ND	ND	ND	100	93	ND	102	49
24P	PCB-1016	ND	39	ND	ND	ND	0	-	ND	0	-
25P	Toxaphene	ND	11	ND	ND	ND	0	-	ND	0	-

[a] Recovery normally variable using established methodology.

NOV 29, 1986

TABLE 1: QUANTITATIVE RESULTS

Metals - Analysis Data (QR52)

Chain of Custody Data Required for ETC Data Management Summary Reports

ETC Sample No.	Company	Facility	Sample Point	Date	Time	Elapsed Hours
P4852	ENVIRONMENTAL STRATEGIES CORP.	CHAMPION	WCSP-3	861110	1400	

Compound	Results									
	Sample Concen. ug/l	MDL ug/l								
Barium	52	3.2								
Chromium	ND	26								
Copper	BMDL	13								
Iron	BMDL	140								
Manganese	500	6.4								
Nickel	18	11								
Sodium	191000	72								
Zinc	150	2.9								

ETC ENVIRONMENTAL TESTING and CERTIFICATION

DEC 13, 1986

TABLE 1: QUANTITATIVE RESULTS and QUALITY ASSURANCE DATA

Conventional Analysis Data (QR10)

Chain of Custody Data Required for ETC Data Management Summary Reports

ETC Sample No.	Company	Facility	Sample Point	Date	Time	Elapsed Hours
P4852	ENVIRONMENTAL STRATEGIES CORP.	CHAMPION	WCSP-3	861110	1400	

NPDES Number	Results									
	Sample Concen. mg/l	MDL mg/l								
Fluoride	2.53	.10								
Nitrate as N	.40	.10								
Sulfate as S04	180	2								
Phenolics, Total	<.050	.050								
Cyanide, Total	1.08	.025								
Solids, total suspended	17300	2								

305-199

ETC ENVIRONMENTAL TESTING and CERTIFICATION

December 1, 1986

TABLE 2: METHOD PERFORMANCE DATA

Surrogate Recovery - Aqueous Matrices (QR20)

Chain of Custody Data Required for ETC Data Management Summary Reports

P4852

ETC Sample No. | Company | Facility | Sample Point | Date | Time | Elapsed Hours

Compound	Amount Added ug	% Recovery	Control Limits *	
			Lower	Upper
VOLATILE FRACTION (GC/MS)				
Toluene-D8	.250	95	88	110
Bromofluorobenzene	.250	97	86	115
1,2-Dichloroethane-D4	.250	100	76	114
ACID FRACTION (GC/MS)				
Phenol-D5	100	98	10	94
2-Fluorophenol	100	102	21	100
2,4,6-Tribromophenol	100	78	10	123
BASE/NEUTRAL FRACTION (GC/MS)				
Nitrobenzene-D5	50	99	35	114
2-Fluorobiphenyl	50	80	43	116
Terphenyl-D14	50	24***	33	141
PESTICIDE/PCB FRACTION (GC/MS)				
Dibutylchlorendate	-	-	24**	154**

* IFB EPA Control Limits.
** Advisory Limits Only.
*** Recovery manually verified.

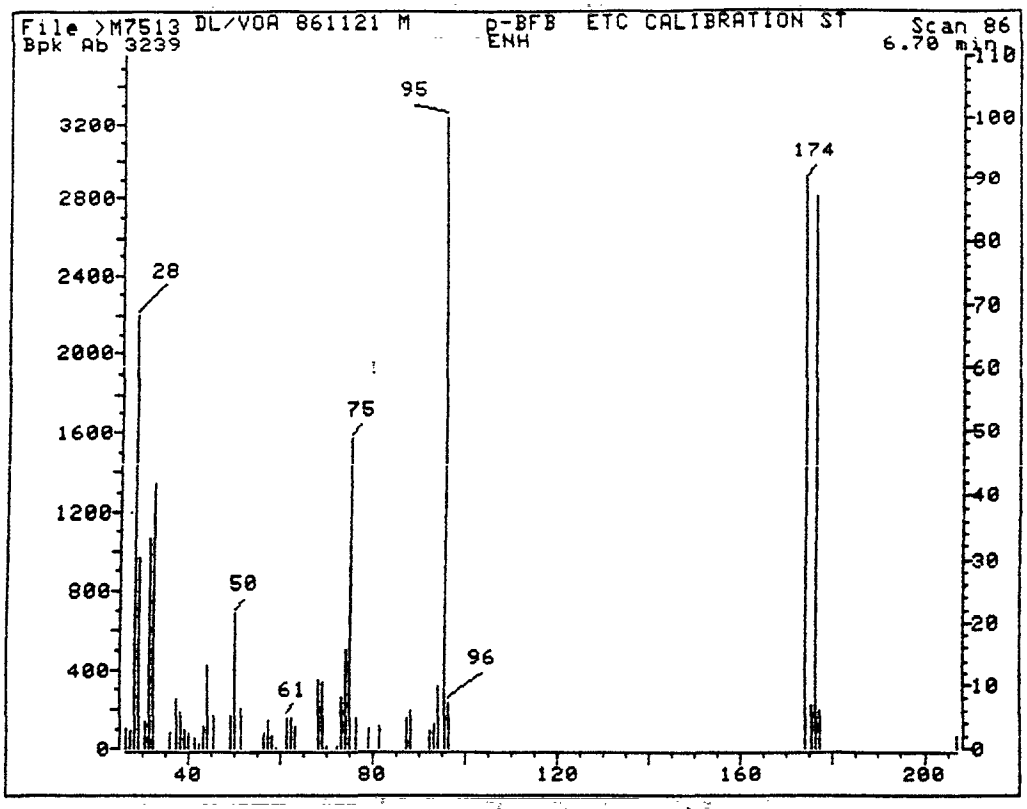


TABLE 2: METHOD PERFORMANCE DATA (QR21)

GC/MS Tuning Data - Bromofluorobenzene (BFB) for Volatiles Analysis

m/z	Ion Abundance Criteria	% Relative Abundance Base Peak	% Relative Abundance Appropriate Peak	Status
50	15-40% of mass 95	21.09	21.09	Ok
75	30-60% of mass 95	48.39	48.39	Ok
95	Base peak, 100% relative abundance	100.00	100.00	Ok
96	5-9% of mass 95	7.22	7.22	Ok
173	Less than 1% of mass 95	0.00	0.00	Ok
174	Greater than 50% of mass 95	89.98	89.98	Ok
175	5-9% of mass 174	6.74	7.49	Ok
176	95-101% of mass 174	87.27	96.99	Ok
177	5-9% of mass 176	5.98	6.86	Ok

Injection Date: 11/21/86
Injection Time: 20:42
Run No: >M7513
Spectrun No: 86

Analyst: [signature]
Processor: [signature]
QC Batch: QV 5431
Samples: P4240, P4241, P4242, P4243, P4244
P4236, P4237, P4239, P4235, P5333
P5415, P5414, P4850, P4851, P485

11/25/86

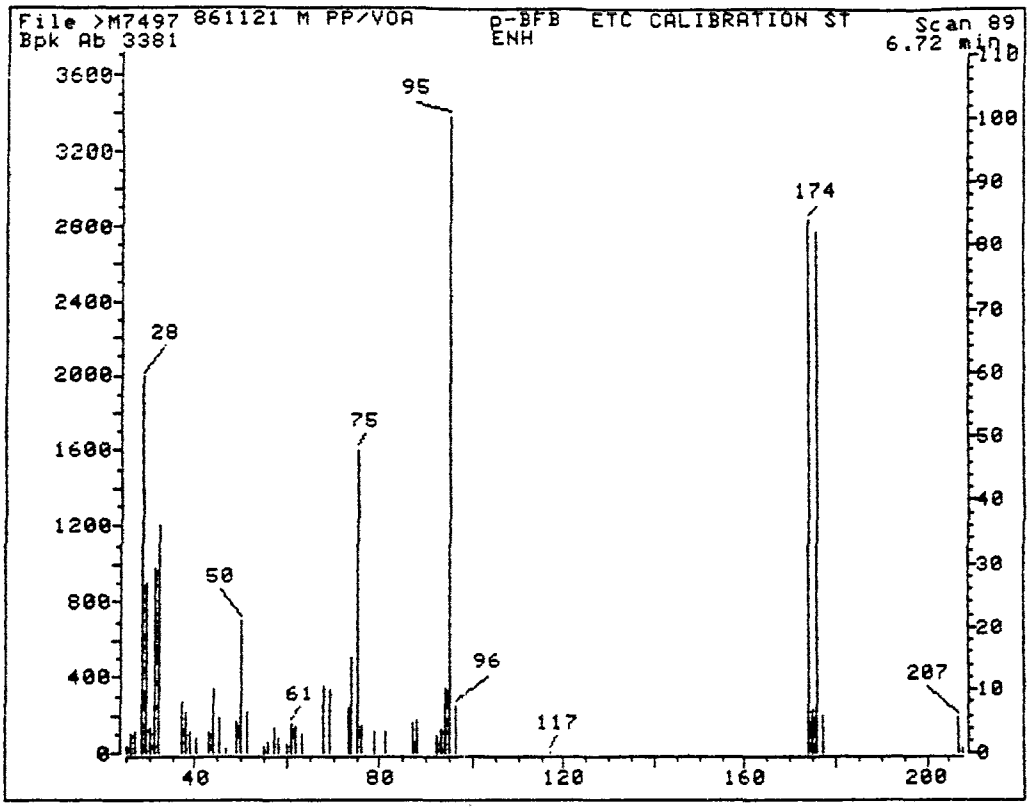


TABLE 2: METHOD PERFORMANCE DATA (QR21)

GC/MS Tuning Data - Bromofluorobenzene (BFB) for Volatiles Analysis

m/z	Ion Abundance Criteria	% Relative Abundance Base Peak	% Relative Abundance Appropriate Peak	Status
50	15-40% of mass 95	20.80	20.80	Ok
75	30-60% of mass 95	47.52	47.52	Ok
95	Base peak, 100% relative abundance	100.00	100.00	Ok
96	5-9% of mass 95	7.18	7.18	Ok
173	Less than 1% of mass 95	0.00	0.00	Ok
174	Greater than 50% of mass 95	83.99	83.99	Ok
175	5-9% of mass 174	6.60	7.85	Ok
176	95-101% of mass 174	82.16	97.82	Ok
177	5-9% of mass 176	5.86	7.13	Ok

Injection Date: 11/21/86
Injection Time: 05:57
Run No: >M7497
Spectrun No: 89

Analyst: Joyce Quinn
Processor: Susan Christopher
QC Batch: QV5931
Samples: P4240, P4241, P4242, P4243, P424
P4236, P4237, P4239, P4235, P533
P5415, P5414, P4850, P4851, P48

005202

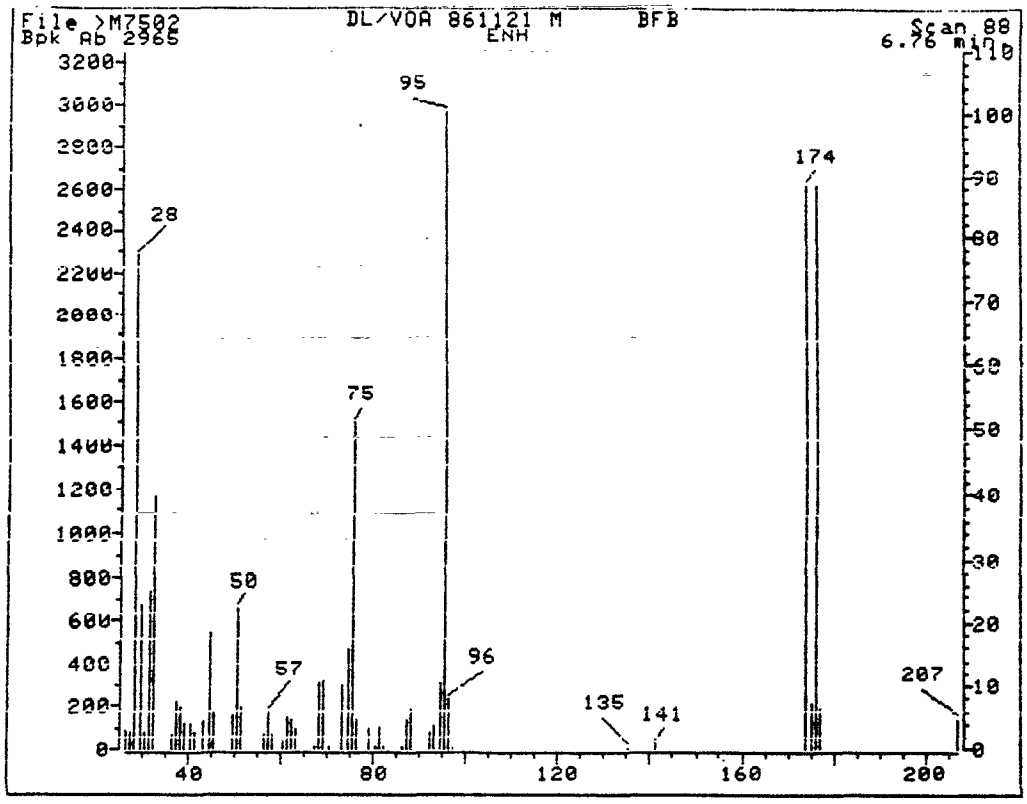


TABLE 2: METHOD PERFORMANCE DATA (QR21)

GC/MS Tuning Data - Bromofluorobenzene (BFB) for Volatiles Analysis

m/z	Ion Abundance Criteria	% Relative Abundance Base Peak	% Relative Abundance Appropriate Peak	Status
50	15-40% of mass 95	22.00	22.00	Ok
75	30-60% of mass 95	50.62	50.62	Ok
95	Base peak, 100% relative abundance	100.00	100.00	Ok
96	5-9% of mass 95	7.63	7.63	Ok
173	Less than 1% of mass 95	0.00	0.00	Ok
174	Greater than 50% of mass 95	88.52	88.52	Ok
175	5-9% of mass 174	7.03	7.95	Ok
176	95-101% of mass 174	88.43	99.89	Ok
177	5-9% of mass 176	6.31	7.13	Ok

Injection Date: 11/21/86
Injection Time: 09:32
Run No: >M7502
Spectrun No: 88

Analyst: [signature]
Processor: [signature]
QC Batch: QV 5931
Samples: P4240, P4241, P4242, P4243, P4244, P4236, P4237, P4238, P4239, P5336, P5415, P5414, P4850, P4851, P4852

305203

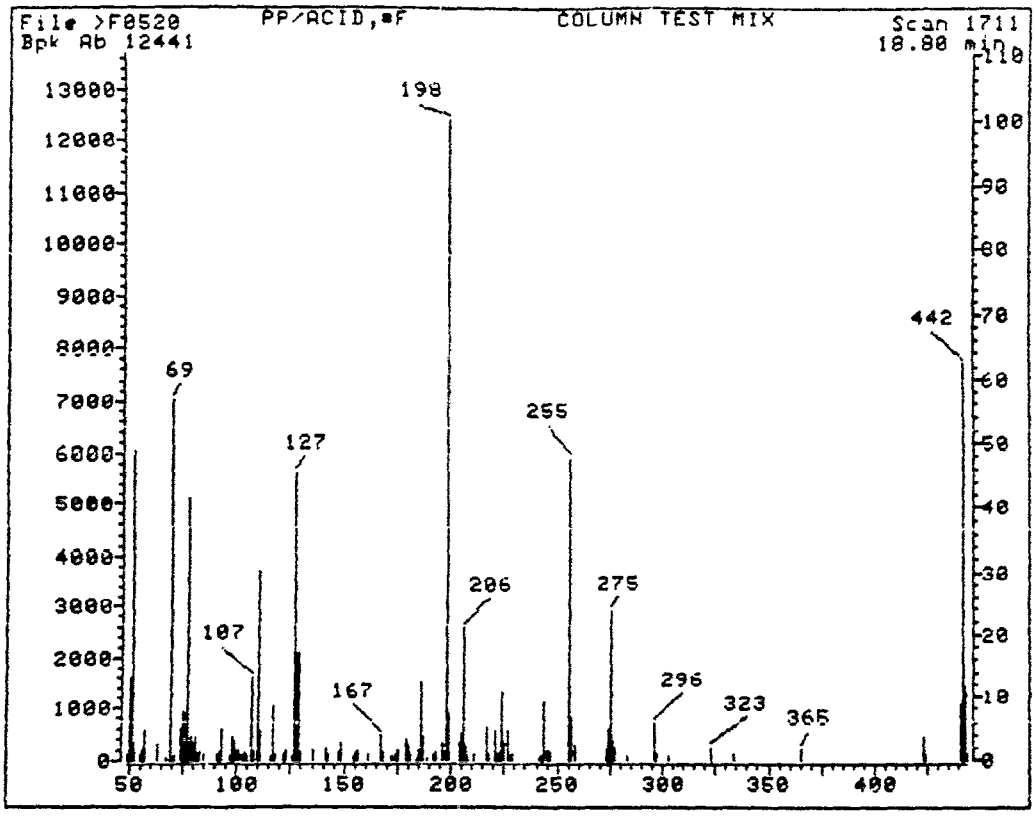


TABLE 2: METHOD PERFORMANCE DATA (QR22)

GC/MS Tuning Data - Decafluorotriphenylphospine (DFTPP) for Acids Analysis

m/z	Ion Abundance Criteria	% Relative Abundance Base Peak	% Relative Abundance Appropriate Peak	Status
51	30-60% of mass 198	48.52	48.52	Ok
68	Less than 2% of mass 69	0.00	0.00	Ok
69	(reference only)	56.51	56.51	Ok
70	Less than 2% of mass 69	.42	.74	Ok
127	40-60% of mass 198	45.35	45.35	Ok
197	Less than 1% of mass 198	0.00	0.00	Ok
198	Base peak, 100% relative abundance	100.00	100.00	Ok
199	5-9% of mass 198	7.19	7.19	Ok
275	10-30% of mass 198	23.50	23.50	Ok
365	Greater than 1% of mass 198	1.89	1.89	Ok
441	0-100% of mass 443	8.79	76.34	Ok
442	Greater than 40% of mass 198	62.49	62.49	Ok
443	17-23% of mass 442	11.52	18.43	Ok

Injection Date: 11/26/86 Analyst: J. AO
Injection Time: 07:29 Processor: Grant Frank
Run No: >F0520 QC Batch: QA6013
Spectrun No: 1711 Samples: G0447-G0450, G0457, G0458, G0467, G0468, G0471, G0472, G0489, G0493-G0495, G4852, G4853, G4872

KS 11/29/86

305204

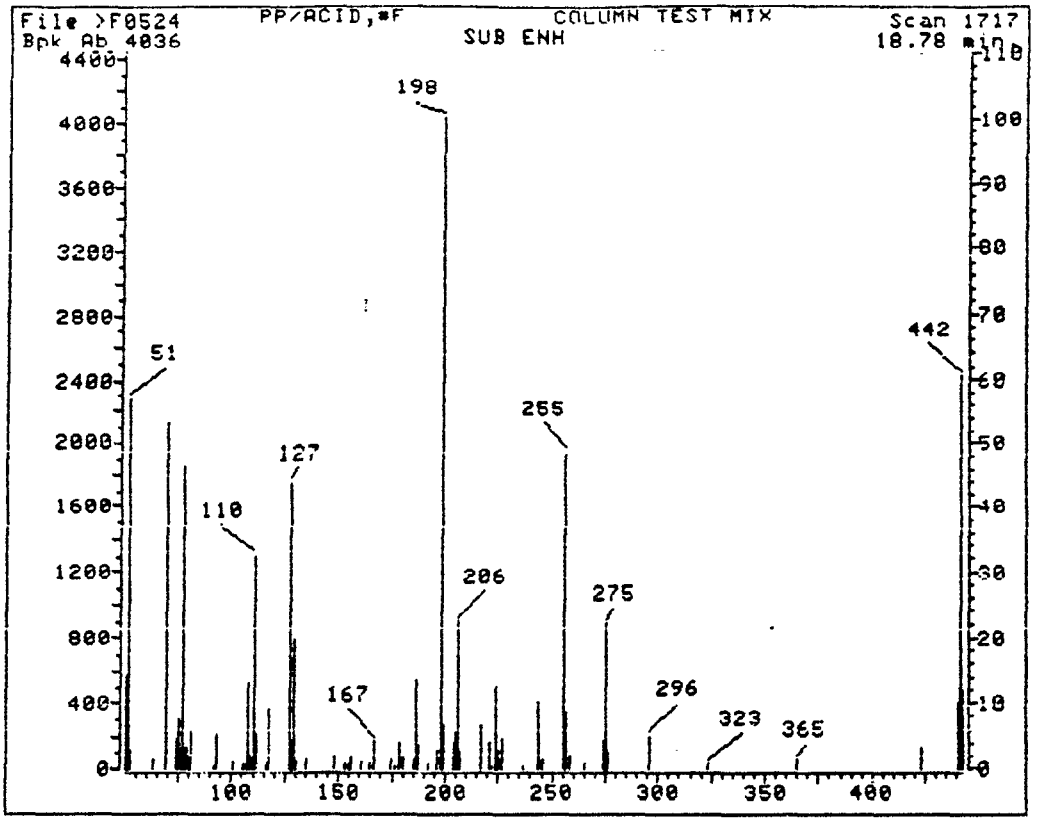


TABLE 2: METHOD PERFORMANCE DATA (QR22)

GC/MS Tuning Data - Decafluorotriphenylphospine (DFTPP) for Acids Analysis

m/z	Ion Abundance Criteria	% Relative Abundance Base Peak	% Relative Abundance Appropriate Peak	Status
51	30-60% of mass 198	56.57	56.57	Ok
68	Less than 2% of mass 69	0.00	0.00	Ok
69	(reference only)	52.49	52.49	Ok
70	Less than 2% of mass 69	0.00	0.00	Ok
127	40-60% of mass 198	43.39	43.39	Ok
197	Less than 1% of mass 198	0.00	0.00	Ok
198	Base peak, 100% relative abundance	100.00	100.00	Ok
199	5-9% of mass 198	6.54	6.54	Ok
275	10-30% of mass 198	21.76	21.76	Ok
365	Greater than 1% of mass 198	1.26	1.26	Ok
441	0-100% of mass 443	10.00	84.54	Ok
442	Greater than 40% of mass 198	60.51	60.51	Ok
443	17-23% of mass 442	11.83	19.55	Ok

Injection Date: 11/26/86 Analyst: JA
Injection Time: 11:04 Processor: Brent Trant
Run No: >F0524 QC Batch: QA6013
Spectrun No: 1717 Samples: 80447-80450, 80452, 80453, 80457, 80458, 80467, 80468, 80471, 80472.

11/29/86

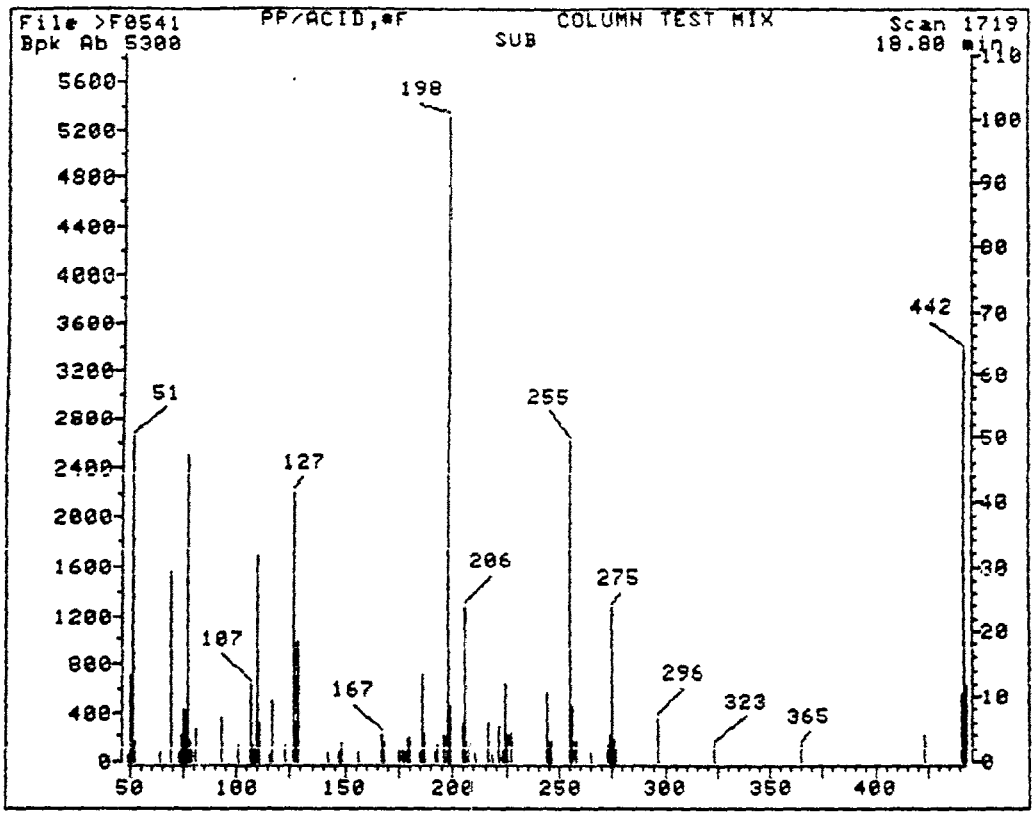


TABLE 2: METHOD PERFORMANCE DATA (QR22)

GC/MS Tuning Data - Decafluorotriphenylphospine (DFTPP) for Acids Analysis

m/z	Ion Abundance Criteria	% Relative Abundance Base Peak	% Relative Abundance Appropriate Peak	Status
51	30-60% of mass 198	49.92	49.92	Ok
68	Less than 2% of mass 69	0.00	0.00	Ok
69	(reference only)	29.34	29.34	Ok
70	Less than 2% of mass 69	0.00	0.00	Ok
127	40-60% of mass 198	41.43	41.43	Ok
197	Less than 1% of mass 198	0.00	0.00	Ok
198	Base peak, 100% relative abundance	100.00	100.00	Ok
199	5-9% of mass 198	8.38	8.38	Ok
275	10-30% of mass 198	23.66	23.66	Ok
365	Greater than 1% of mass 198	2.28	2.28	Ok
441	0-100% of mass 443	10.34	88.96	Ok
442	Greater than 40% of mass 198	63.66	63.66	Ok
443	17-23% of mass 442	11.62	18.26	Ok

Injection Date: 11/26/86 Analyst: [signature]
Injection Time: 22:39 Processor: [signature]
Run No: >F0541 QC Batch: QA6013
Spectrun No: 1719 Samples: 80494, 80493, 80494, 80495

KS 12/1/86

305206

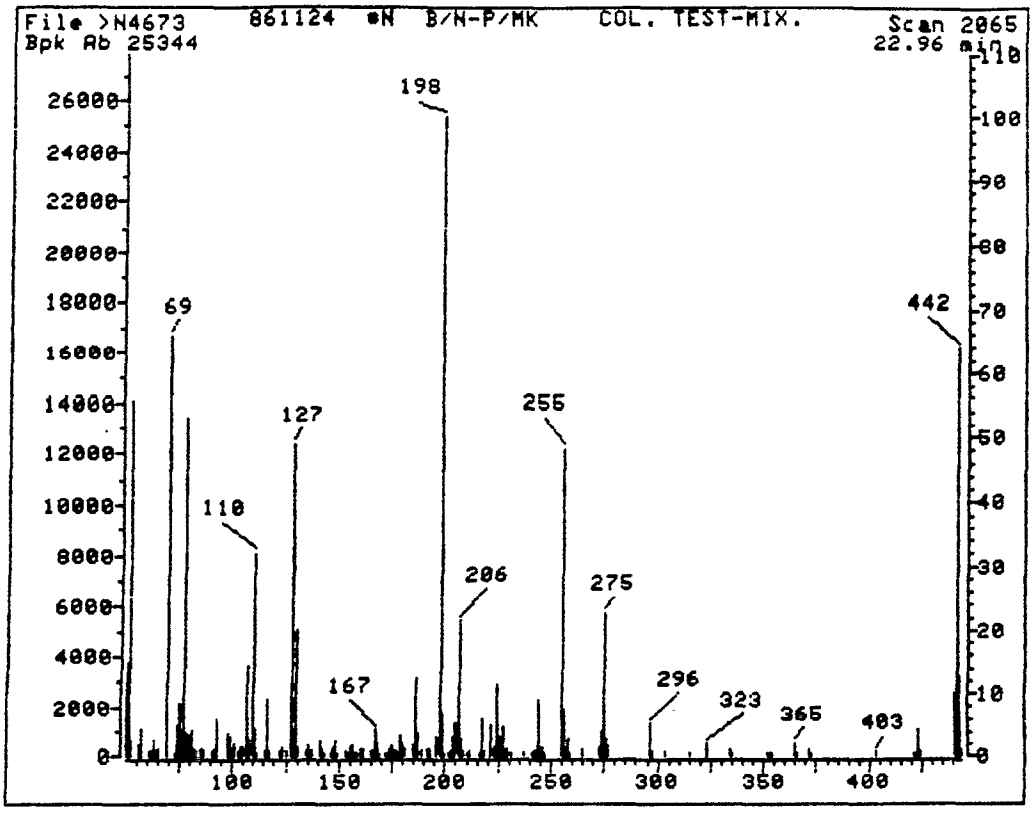


TABLE 2: METHOD PERFORMANCE DATA (QR23)

GC/MS Tuning Data - Decafluorotriphenylphospine (DFTPP) for Base/Neutral Analysis

m/z	Ion Abundance Criteria	% Relative Abundance Base Peak	% Relative Abundance Appropriate Peak	Status
51	30-60% of mass 198	55.50	55.50	Ok
68	Less than 2% of mass 69	0.00	0.00	Ok
69	(reference only)	65.88	65.88	Ok
70	Less than 2% of mass 69	0.00	0.00	Ok
127	40-60% of mass 198	48.83	48.83	Ok
197	Less than 1% of mass 198	0.00	0.00	Ok
198	Base peak, 100% relative abundance	100.00	100.00	Ok
199	5-9% of mass 198	6.67	6.67	Ok
275	10-30% of mass 198	22.60	22.60	Ok
365	Greater than 1% of mass 198	2.14	2.14	Ok
441	0-100% of mass 443	9.87	78.53	Ok
442	Greater than 40% of mass 198	64.00	64.00	Ok
443	17-23% of mass 442	12.57	19.64	Ok

Injection Date: 11/25/86 Analyst: J. Hendel
Injection Time: 14:37 Processor: W. McC.
Run No: >N4673 QC Batch: QB6013
Spectrun No: 2065 Samples: P0447-P0450, P0452, P0458, P0459, P0468, P0471, P0472, P0479, P0493-P0495, P0852, P0853

LAH 11-30

305207

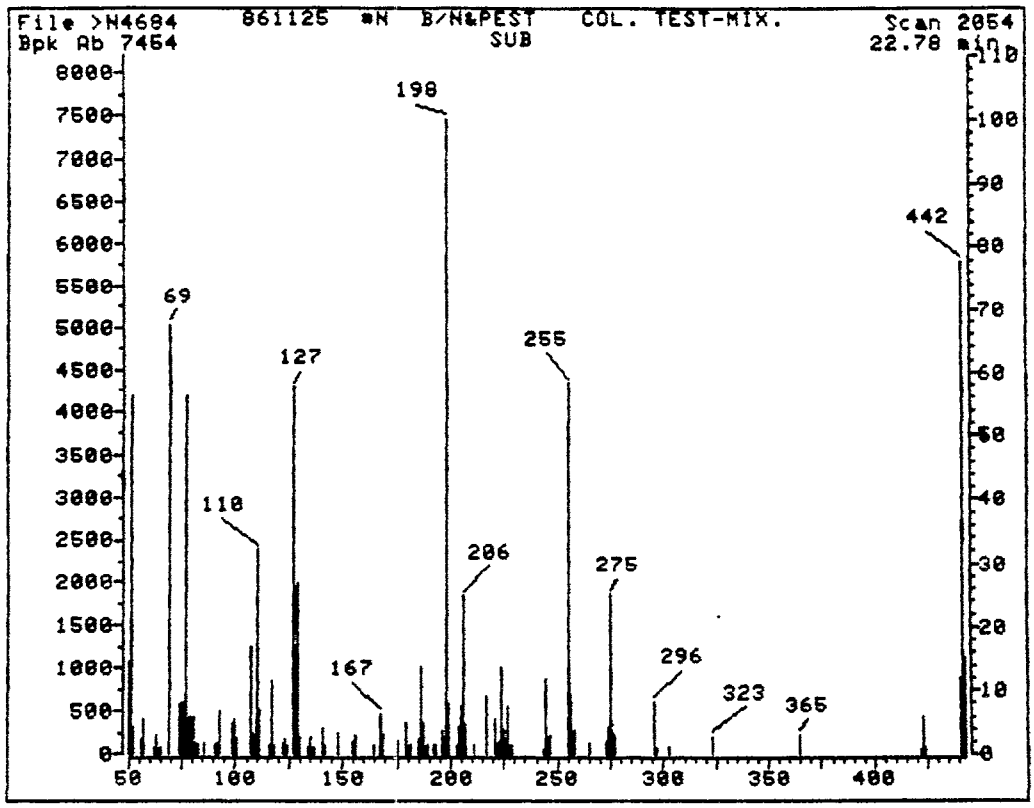


TABLE 2: METHOD PERFORMANCE DATA (QR23)

GC/MS Tuning Data - Decafluorotriphenylphospine (DFTPP) for Base/Neutral Analysis

m/z	Ion Abundance Criteria	% Relative Abundance Base Peak	% Relative Abundance Appropriate Peak	Status
51	30-60% of mass 198	56.12	56.12	Ok
68	Less than 2% of mass 69	0.00	0.00	Ok
69	(reference only)	67.41	67.41	Ok
70	Less than 2% of mass 69	0.00	0.00	Ok
127	40-60% of mass 198	57.59	57.59	Ok
197	Less than 1% of mass 198	0.00	0.00	Ok
198	Base peak, 100% relative abundance	100.00	100.00	Ok
199	5-9% of mass 198	7.90	7.90	Ok
275	10-30% of mass 198	25.03	25.03	Ok
365	Greater than 1% of mass 198	3.03	3.03	Ok
441	0-100% of mass 443	12.03	79.24	Ok
442	Greater than 40% of mass 198	77.68	77.68	Ok
443	17-23% of mass 442	15.19	19.55	Ok

Injection Date: 11/26/86 Analyst: K. Valentin
Injection Time: 03:17 Processor: W.N.C.
Run No: >N4684 QB Batch: QB6013
Spectrun No: 2054 Samples: P0447-~~50~~-P0450, P0457, P0~~4~~
P0467, P0468, P0471, P0472, P0~~4~~
P0493-P0495, P4852, P4853

LAA 11-30

305208

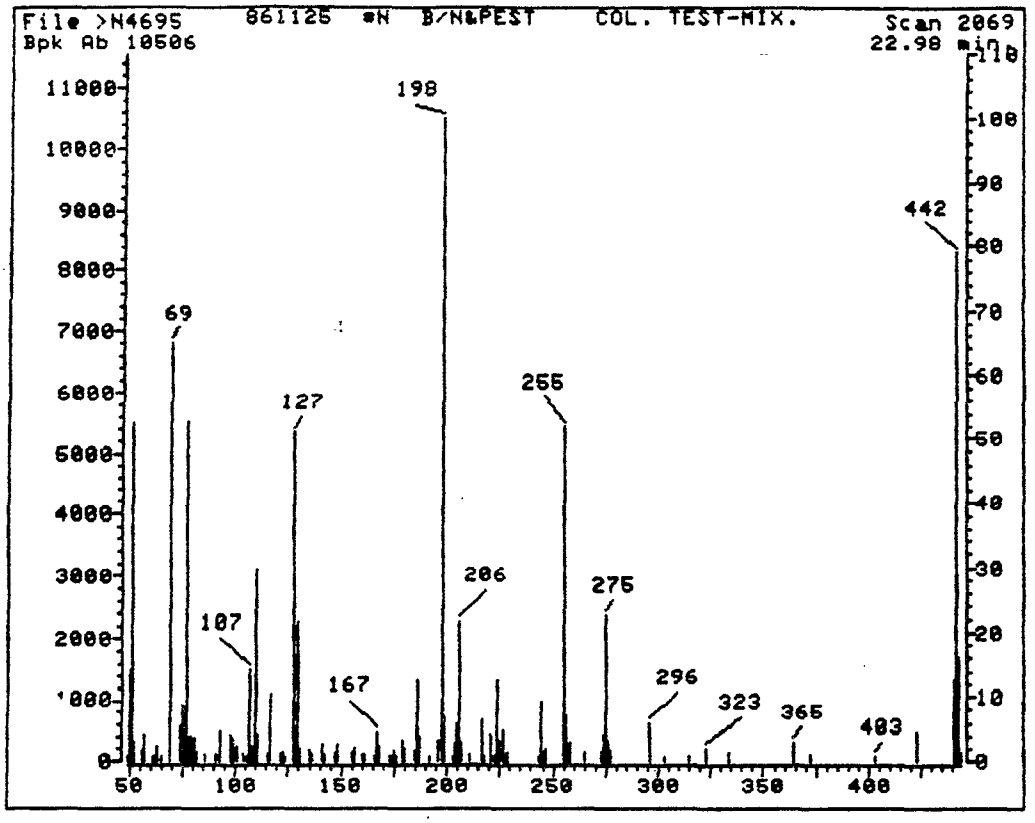


TABLE 2: METHOD PERFORMANCE DATA (QR23)

GC/MS Tuning Data - Decafluorotriphenylphospine (DFTPP) for Base/Neutral Analysis

m/z	Ion Abundance Criteria	% Relative Abundance Base Peak	% Relative Abundance Appropriate Peak	Status
51	30-60% of mass 198	52.28	52.28	Ok
68	Less than 2% of mass 69	0.00	0.00	Ok
69	(reference only)	64.83	64.83	Ok
70	Less than 2% of mass 69	0.00	0.00	Ok
127	40-60% of mass 198	50.89	50.89	Ok
197	Less than 1% of mass 198	0.00	0.00	Ok
198	Base peak, 100% relative abundance	100.00	100.00	Ok
199	5-9% of mass 198	6.94	6.94	Ok
275	10-30% of mass 198	22.61	22.61	Ok
365	Greater than 1% of mass 198	3.04	3.04	Ok
441	0-100% of mass 443	12.55	77.32	Ok
442	Greater than 40% of mass 198	79.16	79.16	Ok
443	17-23% of mass 442	16.24	20.51	Ok

Injection Date: 11/26/86 Analyst: [signature]
Injection Time: 12:15 Processor: W.O.C.C.
Run No: >N4695 QC Batch: QB6013
Spectrun No: 2069 Samples: P0447-P0450, P0452, P0458, P0467, P0468.

LAH 11-30

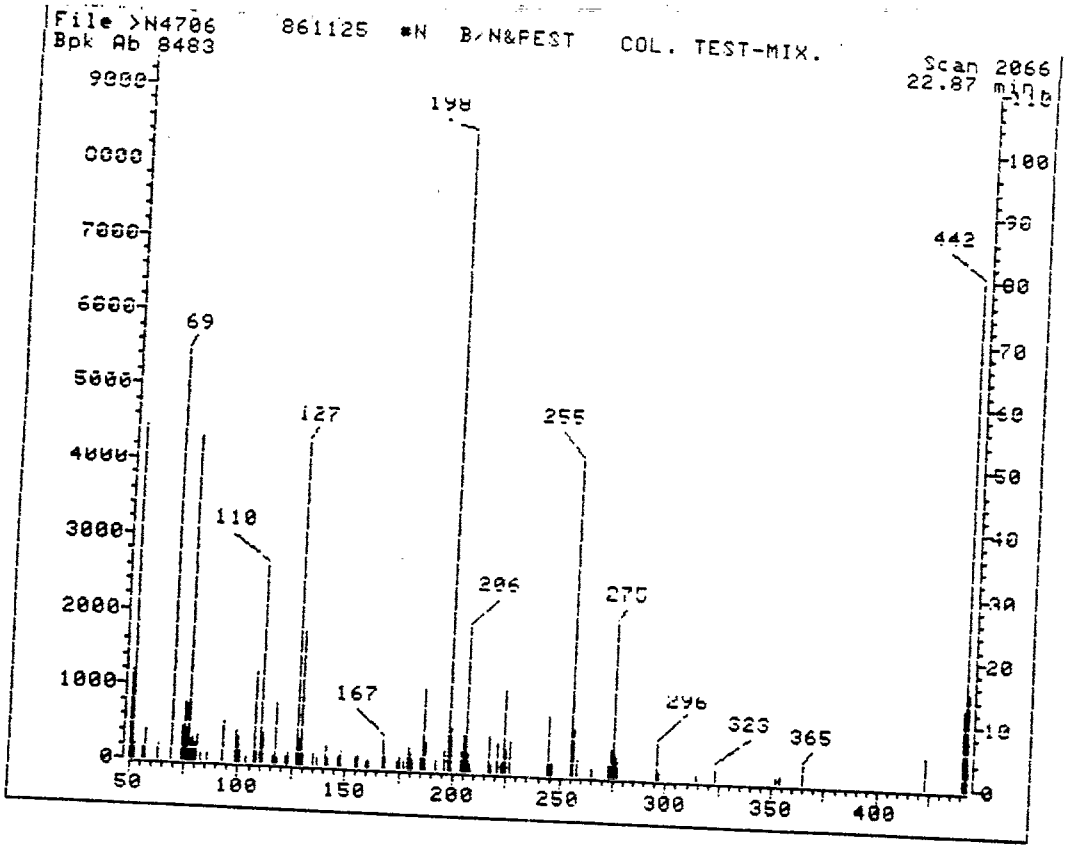


TABLE 2: METHOD PERFORMANCE DATA (WR23)

GC/MS Tuning Data - Decafluorotriphenylphospine (DFTPP) for Base/Neutral Analysis

m/z	Ion Abundance Criteria	% Relative Abundance Base Peak	% Relative Abundance Appropriate Peak	Status
51	30-60% of mass 198	52.22	52.22	Ok
68	Less than 2% of mass 69	0.00	0.00	Ok
69	(reference only)	64.29	64.29	Ok
70	Less than 2% of mass 69	0.00	0.00	Ok
127	40-60% of mass 198	50.49	50.49	Ok
197	Less than 1% of mass 198	0.00	0.00	Ok
198	Base peak, 100% relative abundance	100.00	100.00	Ok
199	5-9% of mass 198	6.64	6.64	Ok
275	10-30% of mass 198	24.07	24.07	Ok
365	Greater than 1% of mass 198	2.91	2.91	Ok
441	0-100% of mass 443	12.58	82.33	Ok
442	Greater than 40% of mass 198	79.88	79.88	Ok
443	17-23% of mass 442	15.28	19.13	Ok

Injection Date: 11/26/86
Injection Time: 21:29
Run No: >N4706
Spectrum No: 2066

Analyst: Shawn Marlow
Processor: D.W.C.
WC Batch: QB6013
Samples: P0671, P0672, P0689, P0693, P0696, P0697, P0698, P0699, P0703

LAH 11-30

305210

Methodology
for
GC/MS Analysis of Priority Pollutant Compounds

The methods employed in the GC/MS analysis for priority pollutants are established EPA methods. Rigid compliance with the instrument parameters and performance criteria of the published methods was achieved. In some cases, the precise amounts of sample used and the sample handling procedures vary with the complexity of the sample matrix. Qualitative identification of the priority pollutants was performed using the relative retention times, the relative abundance of three characteristic ions and the abundance ratios. The entire mass spectrum was reviewed to confirm each identification. Quantitative analysis of detected compounds was performed by using a response factor generated by a major characteristic ion of the specific compound and an internal standard.

Compounds, in addition to those on the priority pollutant list, were identified through a computer-aided search of the NBS-EPA spectra library. After review the identifications are included in a separate tabulation and labelled "tentatively identified".

Volatile Priority Pollutant Compounds

For the analysis of Volatile priority pollutants, EPA Method 624 was used. The method can be summarized as follows: Helium is bubbled through a 5 ml water sample contained in a specially designed purging chamber at ambient temperature. The purgeable volatile organic compounds are transferred from the aqueous phase to the vapor phase. The vapor is swept through a sorbent column where the organic components are trapped. After the purge cycle is complete, the sorbent column is heated and backflushed with helium to desorb the organic purgeables onto a gas chromatographic column. The gas chromatograph is temperature programmed to separate the purgeable mixture. The separated purgeable components are then identified and quantitated using a computerized mass spectrometer.

Acid, Base/Neutral and Pesticide Priority Pollutant Compounds

For the analysis of the Acid, Base/Neutral and Pesticide priority pollutants in an aqueous liquid matrix, EPA Method 625 was used. The method can be summarized as follows: A measured volume of sample, approximately 1 liter, is adjusted to a pH greater than 11 and extracted with methylene chloride. The pH of the sample is adjusted to a value less than 2 and extracted with an aliquot of fresh methylene chloride. A separatory funnel or continuous extractor is used to perform the extractions. The two extracts are dried and concentrated to a 1 ml final volume. Each extract is injected into a GC/MS instrument specifically configured for the correct fraction.

Methodology
for
Analysis of Metals

AQUEOUS

The determination of metals in aqueous samples is performed according to the methods published by EPA in "Methods for Chemical Analysis of Water and Wastes," EPA-600/4-79-020, March, 1983, and the Federal Register, October 26, 1983. Arsenic, selenium and thallium are determined by furnace AA; silver, aluminum, barium, beryllium, boron, cadmium, calcium, chromium, copper, cobalt, iron, magnesium, manganese, molybdenum, nickel, lead, sodium, antimony, tin, titanium, vanadium, and zinc are determined by ICP emission spectrometry, except where lower levels of detection are required: in these cases (e.g. lead in groundwater monitoring samples) furnace AA is used. All furnace AA parameters are run by method of standard additions. The determination of mercury is performed by cold vapor AA.

EP TOXICITY

The determination of metals in aqueous EP Toxicity leachates is performed according to the methods published by EPA in "Test Methods for Evaluating Solid Waste" EPA SW-846, revised April, 1984 and the Federal Register, Oct. 26, 1983. 1979. Silver, arsenic, barium, cadmium, chromium, lead and selenium are determined by ICP emission spectrometry. Mercury is determined using cold vapor AA. For leachates that are organic in nature, the analyses are performed according to the methods described under ***OIL/SLUDGE*** below.

SOIL/SEDIMENT

The determination of silver, beryllium, cadmium, chromium, copper, nickel, antimony, lead, and zinc in sediment samples is performed according to methods published by EPA in "Interim Methods for the Sampling and Analysis of Priority Pollutants in Sediments and Fish Tissue", EPA 600/4-81-055, October 1980. Mercury is determined according to the sediment method published by EPA in "Method for Chemical Analysis of Water and Wastes", EPA 600/4-79-020, March 1983. Arsenic, selenium and thallium are determined by furnace AA using nitric acid in a closed decomposition vessel for sample digestion.

OIL/SLUDGE

The determination of silver, aluminum, boron, barium, beryllium, calcium, cadmium, copper, chromium, cobalt, iron, magnesium, manganese, molybdenum, sodium, nickel, lead, antimony, tin, titanium, vanadium, and zinc in sludge/petroleum-based samples is performed by ICP emission spectrometry using a magnesium nitrate dry ashing digestion technique. Arsenic, selenium and thallium are determined by furnace AA using nitric acid in a closed decomposition vessel for sample digestion. Mercury is determined by cold vapor AA using the same digestion technique.

Summary of
Quality Assurance/Quality Control Procedures (QA/QC)

ETC bases its quality assurance protocols on the following government guidelines:

- "Handbook for Analytical Quality Control in Water and Wastewater Laboratories", EPA-600/4-79-019, March 1979;
- National Enforcement Investigation Center Policies, and Procedures manual; EPA-330/9/79/001-R, October 1979;
- the recommended guidelines for EPA Methods 624 and 625. (Federal Register, December 3, 1979, updated on October 26, 1984);
- "Manual of Analytical Methods for the Analysis of Pesticides in Humans and Environmental Samples," EPA 600/8-80-038, June 1980;
- "Determination of 2,3,7,8-TCDD in Soil and Sediment" EPA, Region VII, Kansas City, September 1983;
- Organic Analysis: Multi-media, Multi Concentration-IFB WA84-A267; and
- Dioxin Analysis:Soil/Sediment Matrix; Multi-Concentration; Selected Ion Monitoring with Jar Extration Procedure-IFB WA84-A002

However, we have modified our protocols to provide a higher level of QA/QC than the guidelines require. For example, we analyze a higher than required number of quality control samples and we pay especially careful attention to the certification of the "reference standard" compounds we use in analysis. Below are listed the key QA/QC elements for the methods we used.

Analysis of Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry

- Each batch of 13 samples consists of 9 customer samples (at a maximun), one blank sample, one spiked blank, one spiked sample and one replicate sample. This amounts to a 30% quality control factor.
- Three surrogate compounds are added to each sample in the batch of 13.
- A blind quality control sample is introduced to the laboratory for analysis on a weekly basis.
- Each GC/MS is checked and retuned, if necessary, at the beginning of each day to ensure that its performance on bromofluorobenzene (BFB) meets the EPA criteria.
- A calibration curve for quantitation is prepared using a mixture of Volatile Organic Priority Pollutant "standards" at a minimum of 3 different concentrations and using a mixture of 3 internal standards at a constant concentration.
- The calibration curve is verified with a mixture of priority pollutant standards every day. If the response factors vary greater than 25%, the instrument must be recalibrated.

Analysis of Organic Compounds Extracted in Acid or Base/Neutral Solutions by Gas Chromatography/Mass Spectrometry

- Each batch of 20 samples consists of 16 customer samples (at a maximum), one blank sample, one spiked blank (for water matrices), one sample spiked with the priority pollutant standard mixture and a duplicate customer sample. This amounts to a 20% quality control factor.

- Three surrogate compounds are added to each sample in the batch for Base/Neutral analysis
- Three surrogate compounds are added to each sample in the batch for Acid analysis.
- A blind quality control sample is introduced to the laboratory for analysis on a weekly basis.
- Each GC/MS is checked and retuned, if necessary, at the beginning of each day to ensure that its performance on decafluorotriphenylphosphine (DFTPP) meets the EPA criteria.
- A calibration curve for quantitation is prepared using a mixture of standards composed of either the Organic Acid or Base/Neutral Extractable Compounds at a minimum of 3 concentrations and using five internal standards for quantitation.

Analysis of Metals

All Samples

- New standards are prepared for each batch of samples
- Normal calibration is performed using a blank sample and four standards that have been through the sample preparation procedure. A regression analysis is used to construct the calibration curve.
- All EP Toxicity samples and all samples determined by furnace atomic absorption are calculated by the "method of additions".
- For each sample analysis that requires the use of the "method of additions" technique, a three point calibration is performed using U.S. EPA "Methods for Chemical Analysis of Water and Wastes, 1979". Results are obtained using linear regression analysis. Any regression with a coefficient of correlation below 0.990 is considered suspect, necessitating review of calibration data or sample re-analysis.
- In constructing the normal calibration curves the lowest concentration levels we use are values greater than or equal to 5 times the Instrumental Detection Limit (IDL).
- All calibration standards are analyzed in duplicate, at a minimum.
- Independent reference standards are used to check the accuracy of calibration standards.
- A check standard is analyzed after every ten samples to validate the normal calibration curve.
- One customer sample out of every ten is analyzed in triplicate.

Homogeneous Samples (except for Mercury analysis)

Samples are analyzed in batches of 30 or less. For batches in which the sample matrices are homogeneous, the QC program is a minimum of 25% and consists of analyzing:

- 3 sets of triplicate analyses;
- 2 Replicate spikes.
- 1 Independent reference standard;
- 4 Calibration standards (processed using the sample preparation method);
- 4 Calibration standards (without sample preparation); and
- 1 Reagent Blank.

Heterogeneous Samples (except for Mercury analysis)

Samples are analyzed in batches of 30 or less. For batches in which the sample matrices are heterogeneous, the QC program is a minimum of 35% and consists of analyzing:

- 3 sets of triplicate analyses;
- 2 Replicate spikes;
- 1 Replicate independent reference standards;
- 4 Calibration standards (processed using the sample preparation method);
- 1 Procedural Blank;
- 4 Calibration standards (without sample preparation); and
- 1 Reagent Blank.

Analysis of Mercury

To analyze samples for mercury we group them by matrix in batches of 30 or less. Our QC program is a minimum of 30% and consists of analyzing:

- each of the 30 customer samples in duplicate;
- 3 sets of triplicate anaylses;
- 2 Replicate spikes;
- 2 Replicate independent reference standards;
- 10 Calibration standards (processed using the sample preparation method); and
- 2 Procedural Blanks.

Analysis of Pesticides, Herbicides and PCB's by Gas Chromatography

Pesticide, herbicide and PCB samples are grouped in batches of 16 customer samples or less according to the type of analysis to be performed. The QC program for each of these three types of analyses is a minimum of 20% and consists of analyzing

- 1 procedural blank sample(a reagent blank is analyzed in the case of non-water matrices);
- 1 spiked blank sample (the spiked blank is eliminated in the case of non-water matrices);
- 1 replicate sample;
- 1 replicate spiked sample; and
- 1 known refernece QC sample for at least each 100 samples analyzed.

The instrument is calibrated each run with three standards, and checked every 10 samples.

Analysis of Cyanides, Phenols, Fluoride, Chloride, Nitrate and Nitrite

- All parameters are analyzed using a Technicon Autoanalyzer II GT.
- 3 calibration standards are analyzed at the beginning and end of each batch.

- Each batch (up to 80 samples) consists of analyzing one blank, one spiked blank, one duplicate and spiked sample every 20 samples, and an EPA known reference sample.

Analysis of Total Organic Carbon (TOC)

TOC samples are analyzed on a daily basis with the number of samples analyzed per day dependent on the request for duplicate or quadruplicate analyses. The quality control program is designed to maintain the appropriate amount of QC and consists of the following elements:

- Daily instrument calibration
- One blank
- Standard recalibration every 10 samples
- Spiked samples at a low and high level
- Every sample is run in duplicate at a minimum

Analysis of Total Organic Halide (TOX)

- Blank reagent water for absolute carbon backround must contain less than 5 ug/l of halide (as chloride).
- Using a trichlorophenol standard, the mean adsorption efficiency must be within +/- 15% of the standard value.
- Calibration standards are run every 10 samples.
- Every sample is run in duplicate at a minimum.

Analysis of 2,3,7,8-TCDD (Dioxin) by GC/MS (SIM)

- Each sample is dosed with a known quantity of $^{13}C_{12}$-2,3,7,8-TCDD as internal standard and $^{37}Cl_4$-TCDD as surogate standard. The action limits for surrogate standard results is +/- 40% of the true value. Samples showing surrogate standard results outside of these limits are reextracted and reanalyzed.
- Two laboratory "method blanks" are run along with each set of 24 or fewer samples. The method blank is also dosed with the internal standard and surrrogate standard.
- At least one per set of 24 samples is run in duplicate to determine intralaboratory precision.
- Qualitative Requirements. The following are met in order to confirm the presence of native 2,3,7,8-TCDD:

  a. Isomer specificity must be demonstrated initially and verified once per 8-hour work shift. The verification consists of injecting a mixture containing TCDD isomers which elute close to 2,3,7,8-TCDD. The 2,3,7,8-TCDD must be separated from interferring isomers, with no more than 25% valley relative to the 2,3,7,8-TCDD peak.

  b. The 320/322 ratio is within the range of 0.67 to 0.87.

  c. Ions 320, 322, and 257 are all present and maximize together the signal to mean noise ratio must be 2.5 to 1 or better for all 3 ions.

  d. The retention time is equal (within 3 seconds) the retention time for the isotopically labeled 2,3,7,8-TCDD.

  e. At least one of the positives can be confirmed by obtaining partial scan spectra from mass 150 to mass 350. The partial scan guidelines are as follows:

. the 320/324 ratio should be 1.58 +/- 0.16

. the 257/259 ratio should be 1.03 +/- 0.10

. the 194/196 ratio should be 1.54 +/- 0.15

- One sample is spiked with native 2,3,7,8-TCDD at a level of 1.0 PPB (for soil) for each set of 24 or fewer samples.
- In cases where no native 2,3,7,8-TCDD is detected, the actual detection limit is estimated and reported based on a signal to noise ratio of 2.5 to 1 at ions 320 and 322.
- For each sample, the internal standard is present with at least a 10 to 1 signal to noise ratio for both mass 332 and mass 334. Also, the internal standard 332/334 ratio must be within the range of 0.67 to 0.87.

Subcontractor QA/QC

Each subcontractoer is required to maintain an appropriate level of quality control. To insure this, each subcontractor is required to submit to ETC the quality control data for all analyses it performs. This data is kept on file at ETC. In general, the amount of quality control required is one duplicate sample with one spiked sample for every ten analyses.

Chain-of-Custody

The chain-of-custody procedure is part of our quality assurance protocol. We believe our chain-of-custody record fully complies with the legal requirements of federal, state and local government agencies and of the courts of law. The record covers:

- labeling of sample bottles, packing the Sample Shuttle and transferring the Shuttle under seal to the custody of a shipper;
- outgoing shipping manifests;
- the chain-of-custody form completed by the person(s) breaking the Shuttle seal, taking the sample, resealing the Shuttle and transferring custody to a shipper;
- incoming shipping manifests;
- breaking the Shuttle's reseal
- storing each labeled sample bottle in a secured area;
- disposition of each sample to an analyst or technician; and
- the use of the sample in each bottle in a testing procedure appropriate to the intended purpose of the sample.

The records show for each link in this process:

- the person with custody; and
- the time and date each person accepted or relinquished custody.

Appendix A

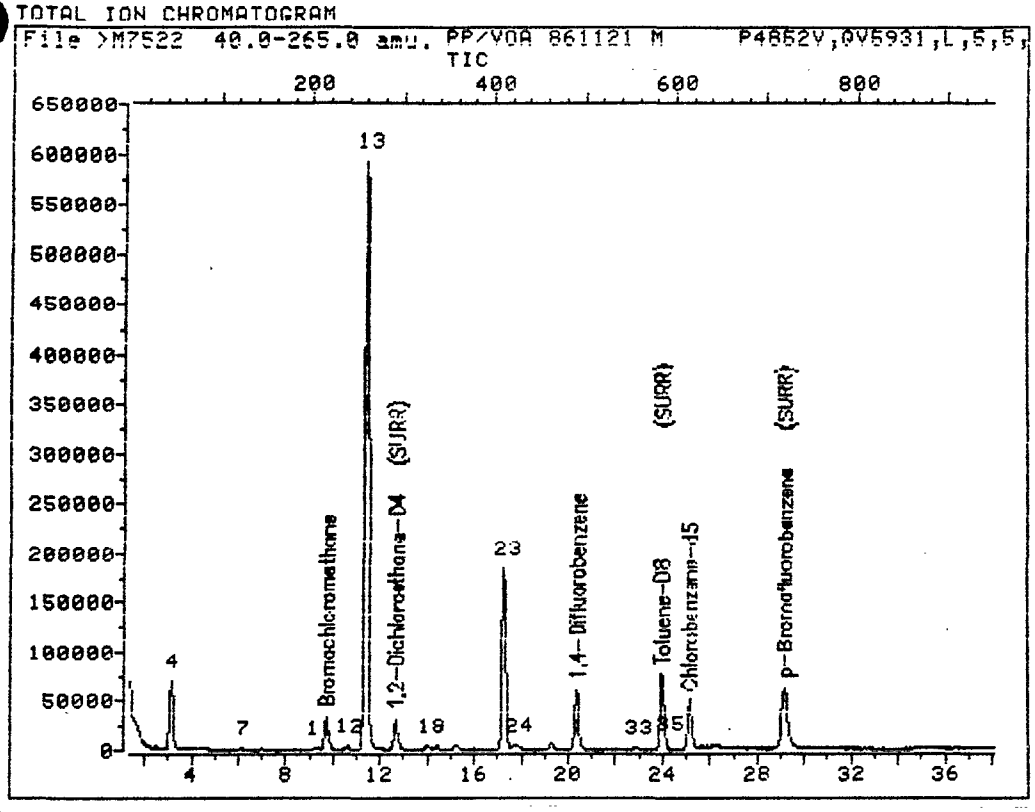
Mass Spectral Data for Quantitated Compounds

1) A total ion chromatogram for each sample analyzed by a GC/MS instrument.

2) A Quant. report used by the analyst to determine qualitative and quantitative results of the compounds present.

3) A mass spectrum and a reference spectrum for each priority pollutant compound detected in the sample.

TOTAL ION CHROMATOGRAM



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Misc: P4852V,QV5931,L,5,5,

Id File: MVOA::US
Title: Volatile Priority Pollutant ID FILE
Last Calibration: 861121 12:01

Operator ID: DG1199
Quant Time: 861122 05:37
Injected at: 861122 04:57

QUANT REPORT

Operator ID: DG1199 Quant Rev: 6 Quant Time: 861122 05:37
Output File: ^M7522::AQ Injected at: 861122 04:57
Data File: >M7522::U4 Dilution Factor: 1.00000
Name: PP/VOA 861121 M
Misc: P4852V,QV5931,L,5,5,

ID File: MVOA::US
Title: Volatile Priority Pollutant ID FILE
Last Calibration: 861121 12:01

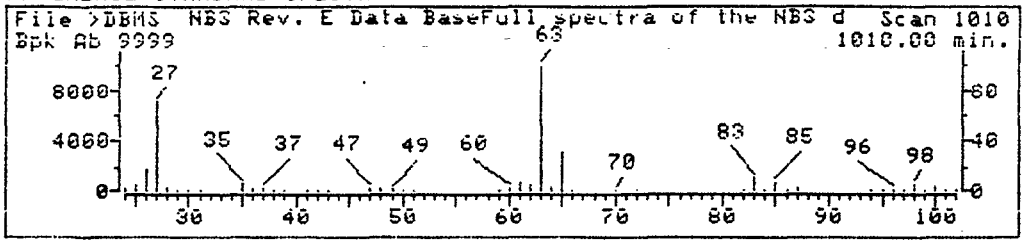
	Compound		R.T.	Scan#	Area	Conc	Units	q
1)	*Bromochloromethane		9.71	217	68147	250.00	NG	98
4)	Vinyl chloride		3.13	47	413329	2566.75	NG	97
~~7)~~	~~Methylene chloride~~		~~6.15~~	~~125~~	~~2913~~	~~19.69~~	~~NG~~	~~98~~
11)	1,1-Dichloroethylene		9.28	206	7173	17.19	NG	97
12)	1,1-Dichloroethane		10.60	240	16448	29.38	NG	97
13)	1,2-Trans-dichloroethylene		11.37	260	2251711	5177.55	NG	97
16)	*1,4-Difluorobenzene		20.36	492	271475	250.00	NG	82
17)	1,2-Dichloroethane-D4	(SURR)	12.65	293	60126	251.24	NG	92
18)	1,1,1-Trichloroethane		14.01	328	13202	26.64	NG	88
~~19)~~	~~Carbon tetrachloride~~		~~14.01~~	~~328~~	~~1814~~	~~3.63~~	~~NG~~	~~98~~
23)	Trichloroethylene		17.26	412	364275	837.31	NG	99
~~24)~~	~~Benzene~~		~~17.76~~	~~425~~	~~5477~~	~~5.01~~	~~NG~~	~~97~~
30)	*Chlorobenzene-d5		25.12	615	190573	250.00	NG	9
~~33)~~	~~Tetrachloroethylene~~		~~22.88~~	~~557~~	~~2952~~	~~5.69~~	~~NG~~	~~89~~
34)	Toluene-D8	(SURR)	23.96	585	327007	236.65	NG	91
~~35)~~	~~Toluene~~		~~24.15~~	~~590~~	~~3720~~	~~2.73~~	~~NG~~	~~89~~
38)	p-Bromofluorobenzene	(SURR)	29.15	719	191071	241.64	NG	99

* Compound is ISTD

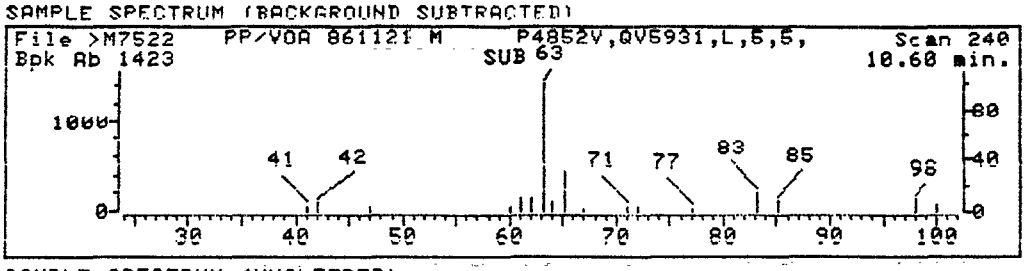
SMC 11/24/86

305220

REFERENCE STANDARD SPECTRUM



SAMPLE SPECTRUM (BACKGROUND SUBTRACTED)



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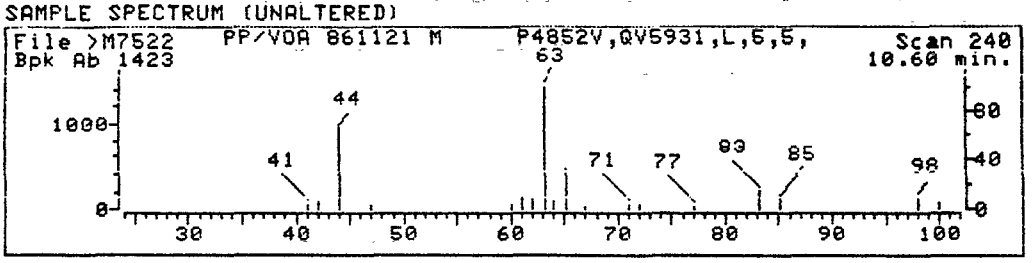

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Misc: P4852V,QV5931,L,5,5,
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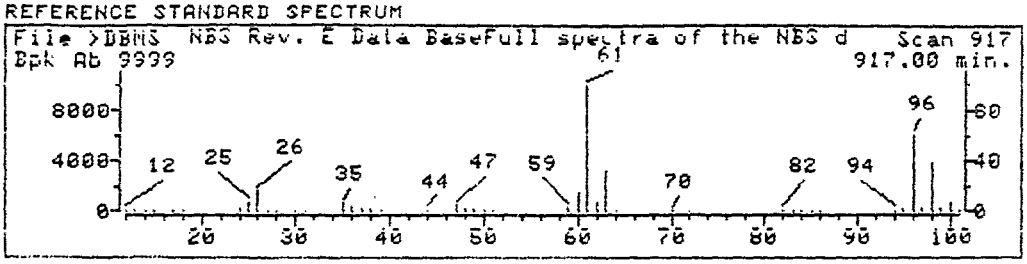
Injected at: 861122 04:57 Last Calibration: 861121 12:01

Compound No: 12
Compound Name: 1,1-Dichloroethane
Scan Number: 240
Retention Time: 10.60 min.
Quant Ion: 63.0
Area: 16448
Concentration: 29.38 NG
q-value: 97

REFERENCE STANDARD SPECTRUM



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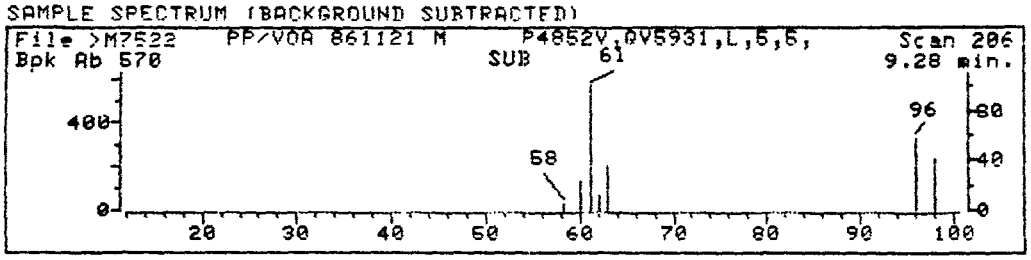

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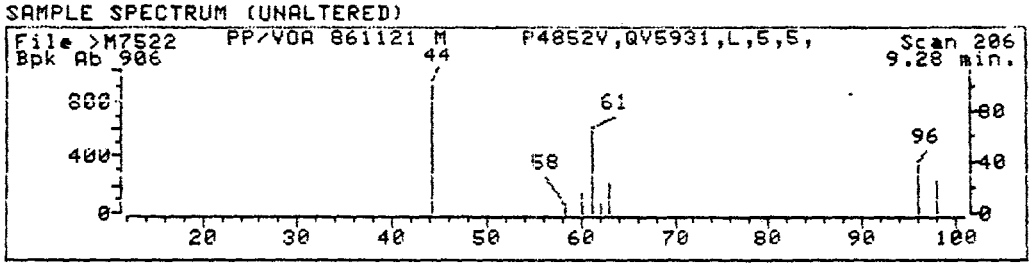

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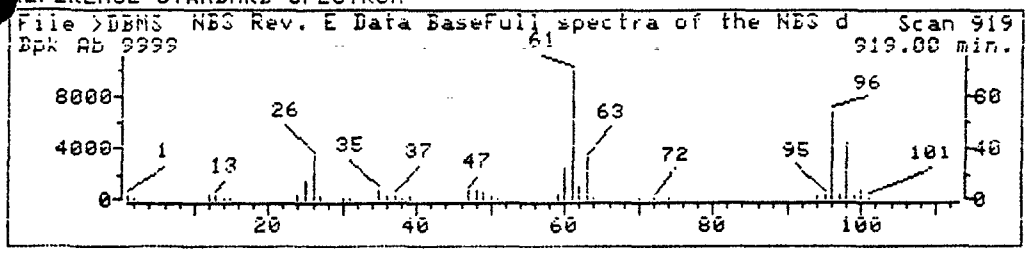
Misc: P4852V,QV5931,L,5,5,
Quant Time: 861122 05:37 Quant ID File: MVUA::U5
Injected at: 861122 04:57 Last Calibration: 861121 12:01

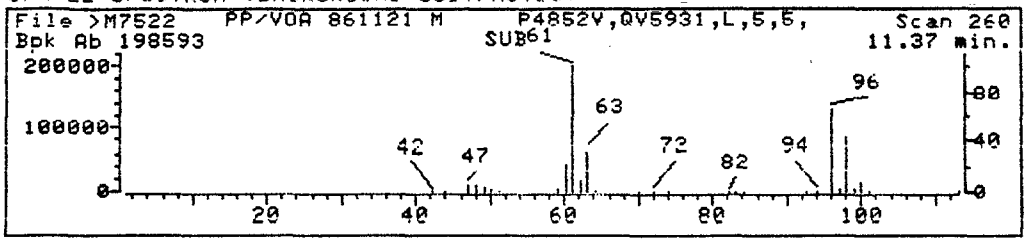
Compound No: 11
Compound Name: 1,1-Dichloroethylene
Scan Number: 206
Retention Time: 9.28 min.
Quant Ion: 61.0
Area: 7173
Concentration: 17.19 NG
q-value: 97

305222

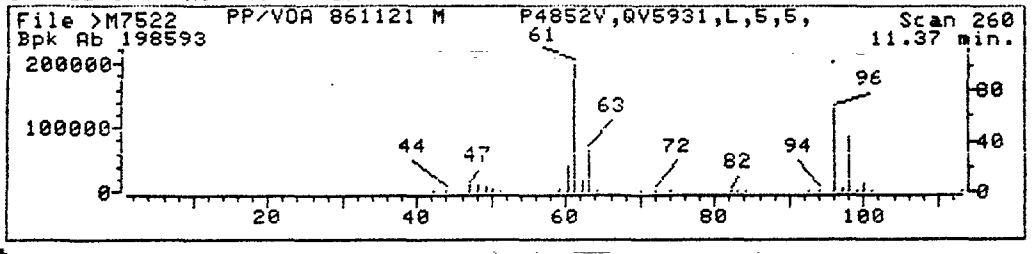
REFERENCE STANDARD SPECTRUM



SAMPLE SPECTRUM (BACKGROUND SUBTRACTED)



SAMPLE SPECTRUM (UNALTERED)



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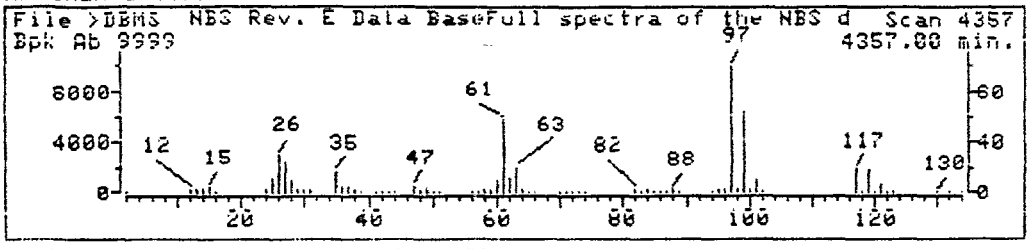
Misc: P4852V,QV5931,L,5,5,
Quant Time: 861122 05:37
Injected at: 861122 04:57

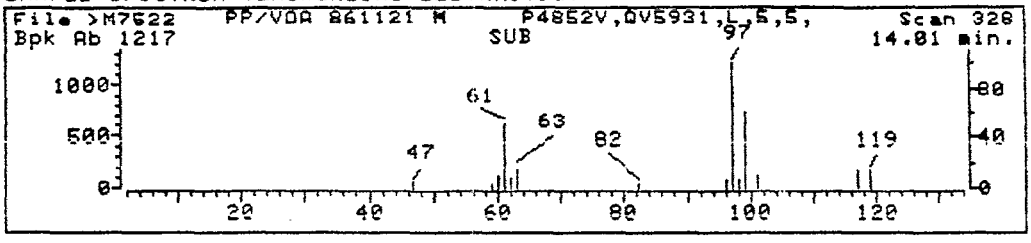
Quant Output File: ^M7522::AW
Quant ID File: MVOA::US
Last Calibration: 861121 12:01

Compound No: 13
Compound Name: 1,2-Trans-dichloroethylene
Scan Number: 260
Retention Time: 11.37 min.
Quant Ion: 61.0
Area: 2251711
Concentration: 5177.55 NG
q-value: 97

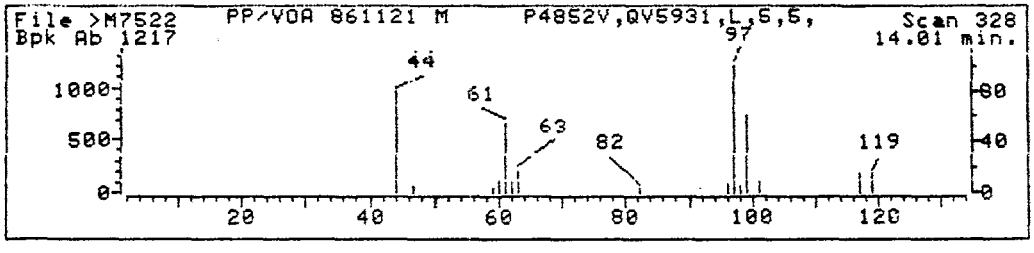
REFERENCE STANDARD SPECTRUM



SAMPLE SPECTRUM (BACKGROUND SUBTRACTED)



SAMPLE SPECTRUM (UNALTERED)



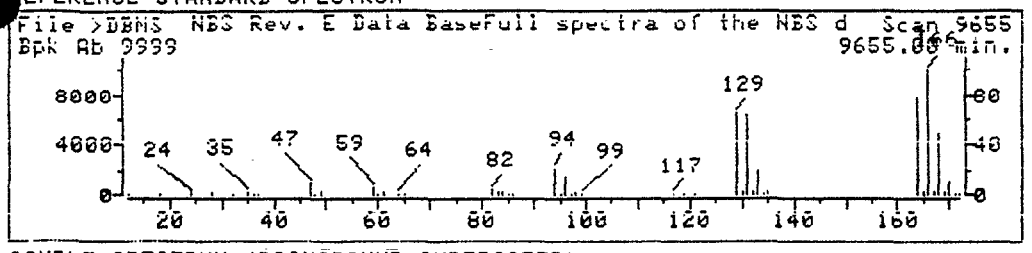
Data File: >M7522::U4
Name: PP/VOA 861121 M
Misc: P4852V,QV5931,L,5,5,
Quant Time: 861122 05:37
Injected at: 861122 04:57

Quant Output File: ^M7522::AQ
Quant ID File: MVOA::US
Last Calibration: 861121 12:01

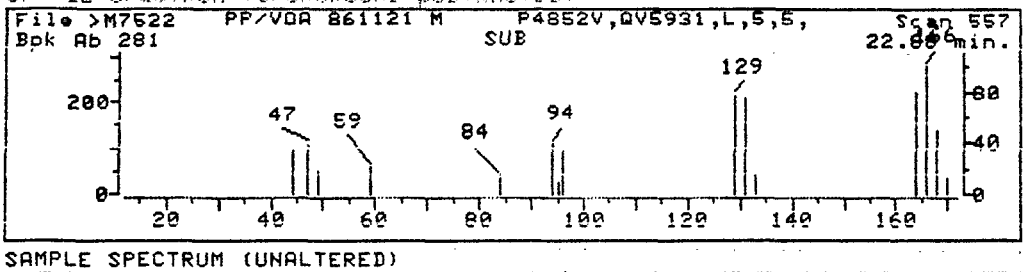
Compound No: 18
Compound Name: 1,1,1-Trichloroethane
Scan Number: 328
Retention Time: 14.01 min.
Quant Ion: 97.0
Area: 13202
Concentration: 26.64 NG
q-value: 88

305224

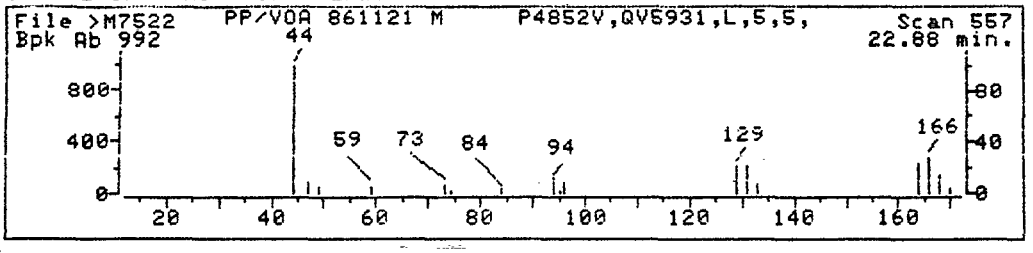
EFERENCE STANDARD SPECTRUM



SAMPLE SPECTRUM (BACKGROUND SUBTRACTED)



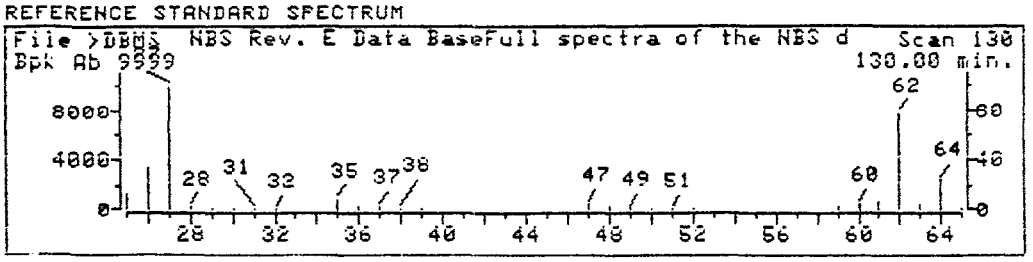
SAMPLE SPECTRUM (UNALTERED)



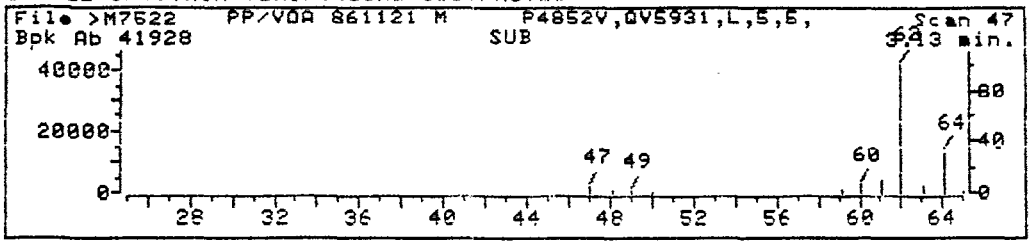
Data File: >M7522::U4 Quant Output File: ^M7522::AW
Name: PP/VOA 861121 M
Misc: P4852V,QV5931,L,5,5,
Quant Time: 861122 05:37 Quant ID File: MVOA::US
Injected at: 861122 04:57 Last Calibration: 861121 12:01

Compound No: 33
Compound Name: Tetrachloroethylene
Scan Number: 557
Retention Time: 22.88 min.
Quant Ion: 166.0
Area: 2952
Concentration: 5.69 NG
q-value: 89

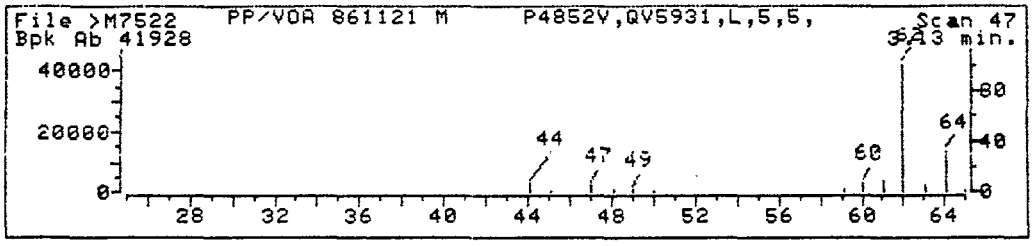
REFERENCE STANDARD SPECTRUM



SAMPLE SPECTRUM (BACKGROUND SUBTRACTED)



SAMPLE SPECTRUM (UNALTERED)



Data File: >M7522::U4
Name: PP/VOA 861121 M
Misc: P4852V,QV5931,L,5,5,
Quant Time: 861122 05:37
Injected at: 861122 04:57

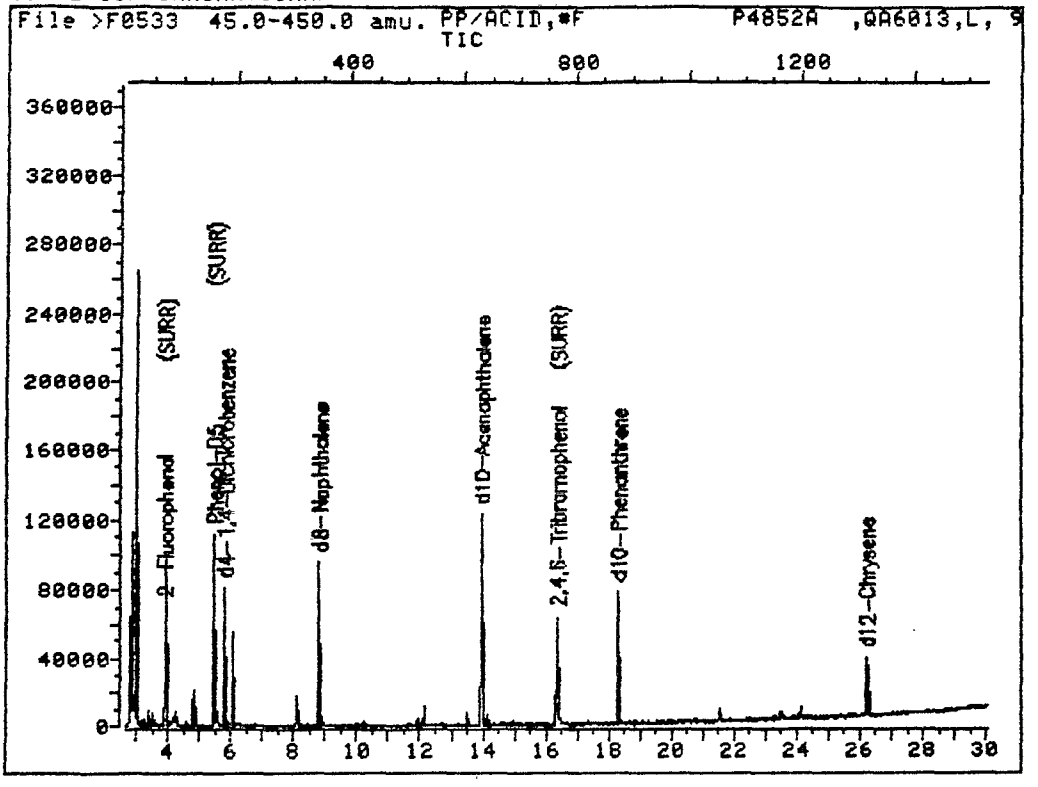
Quant Output File: ^M7522::AW

Quant ID File: MVOA::US
Last Calibration: 861121 12:01

Compound No: 4
Compound Name: Vinyl chloride
Scan Number: 47
Retention Time: 3.13 min.
Quant Ion: 62.0
Area: 413329
Concentration: 2566.75 NG
q-value: 97

305226

TOTAL ION CHROMATOGRAM



Data File: >F0533::U3 Quant Output File: ^F0533::AQ
Name: PP/ACID,#F
Misc: P4852A ,QA6013,L, 930,1 BTL# 9

Id File: FACID::US
Title: PP/ACID IDFILE
Last Calibration: 861126 11:03

Operator ID: JA4996
Quant Time: 861126 17:48
Injected at: 861126 17:15

QUANT REPORT

Operator ID: JA4996 Quant Rev: 6 Quant Time: 861126 17:48
Output File: ^F0533::AQ Injected at: 861126 17:15
Data File: >F0533::U3 Dilution Factor: 1.00000
Name: PP/ACID,#F
Misc: P4852A ,QA6013,L, 930,1 BTL# 9

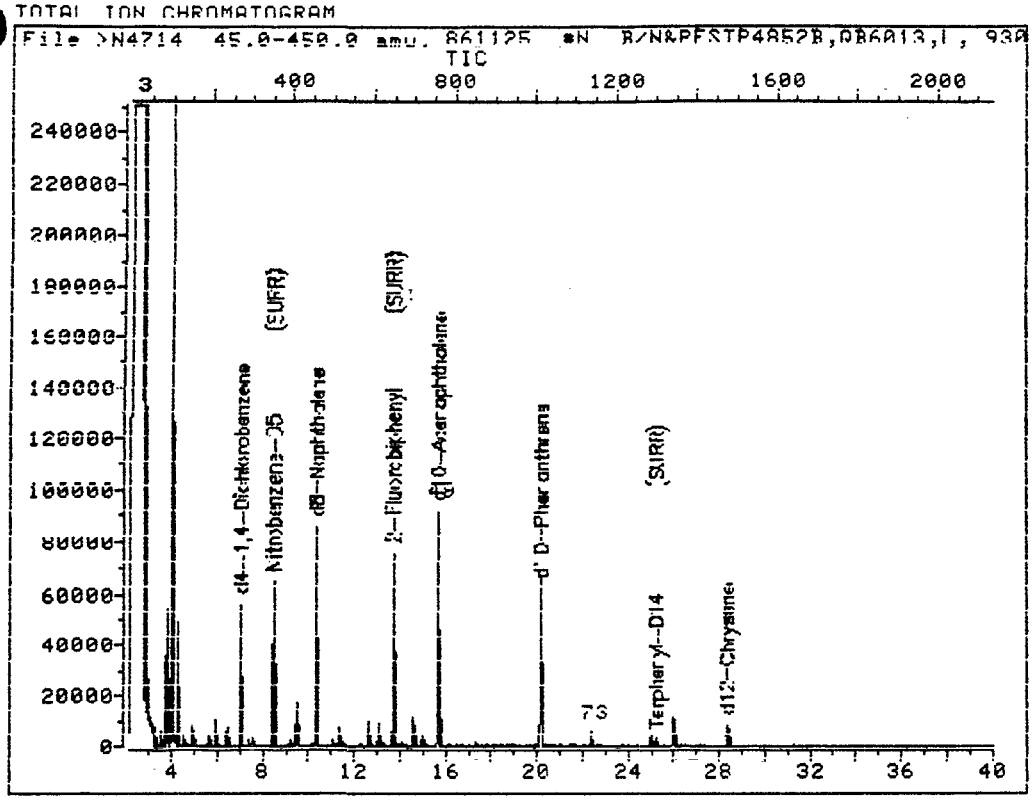
ID File: FACID::US
Title: PP/ACID IDFILE
Last Calibration: 861126 11:03

	Compound		R.T.	Scan#	Area	Conc	Units	q
1)	*d4-1,4-Dichlorobenzene		5.80	177	33098	40.00	UG/ML	92
3)	2-Fluorophenol	(SURR)	3.89	70	60236	101.66	UG/ML	71
9)	Phenol-D5	(SURR)	5.46	158	88911	98.17	UG/ML	96
12)	*d8-Naphthalene		8.81	345	94177	40.00	UG/ML	96
18)	*d10-Acenaphthalene		13.94	632	57335	40.00	UG/ML	96
25)	*d10-Phenanthrene		18.29	875	77353	40.00	UG/ML	99
26)	2,4,6-Tribromophenol	(SURR)	16.36	767	22922	78.43	UG/ML	98
29)	*d12-Chrysene		26.21	1317	34356	40.00	UG/ML	100

* Compound is ISTD

305228

TOTAL ION CHROMATOGRAM



Data File: >N4714::04 Quant Output File: ^N4714::AQ
Name: 861125 #N B/N&PEST
Misc: P4852B,DB6013,L, 930,1 BIL#41

Id File: NBNP::05
Title: B/N+PEST ID FILE
Last Calibration: 861126 12:44

Operator ID: KVO/86
Quant Time: 861127 08:16
Injected at: 861127 03:57

QUANT REPORT

Operator ID: KVU/86 Quant Rev: 6 Quant Time: 86112/ 08:16
Output File: ^N4/14::AQ Injected at: 86112/ 03:57
Data File: >N4/14::U4 Dilution Factor: 1.00000
Name: 861125 #N B/N&PEST
Misc: P4852B,WB6013,L, 950,1 BIL#41

ID File: NBNP::US
Title: B/N+PEST ID FILE
Last Calibration: 861126 12:44

	Compound		R.T.	Scan#	Area	Conc	Units	q
1)	*d4-1,4-Dichlorobenzene		7.00	272	17048	40.00	UG/ML	98
3)	N-Nitrosodimethylamine		2.60	24	1625	~~3.62~~	~~UG~~/ML	100
3)	N-Nitrosodimethylamine		2.69	29	5717	~~12.98~~	~~UG~~/ML	100
12)	Nitrobenzene-D5	(SURR)	8.40	351	50089	49.62	UG/ML	80
21)	*d8-Naphthalene		10.30	458	93843	40.00	UG/ML	99
22)	2-Fluorobiphenyl	(SURR)	13.65	647	68194	39.78	UG/ML	96
42)	*d10-Acenaphthalene		15.65	760	57536	40.00	UG/ML	98
49)	Dimethyl phthalate		15.65	760	15168	~~0.00~~	~~UG/ML~~	99
66)	*d10-Phenanthrene		20.14	1013	79402	40.00	UG/ML	97
73)	Di-n-butyl phthalate		22.35	1138	7308	~~2.04~~	~~UG/ML~~	95
85)	*d12-Chrysene		28.33	1475	9719	40.00	UG/ML	100
98)	Terphenyl-D14	(SURR)	25.21	1299	3448	11.90	UG/ML	96

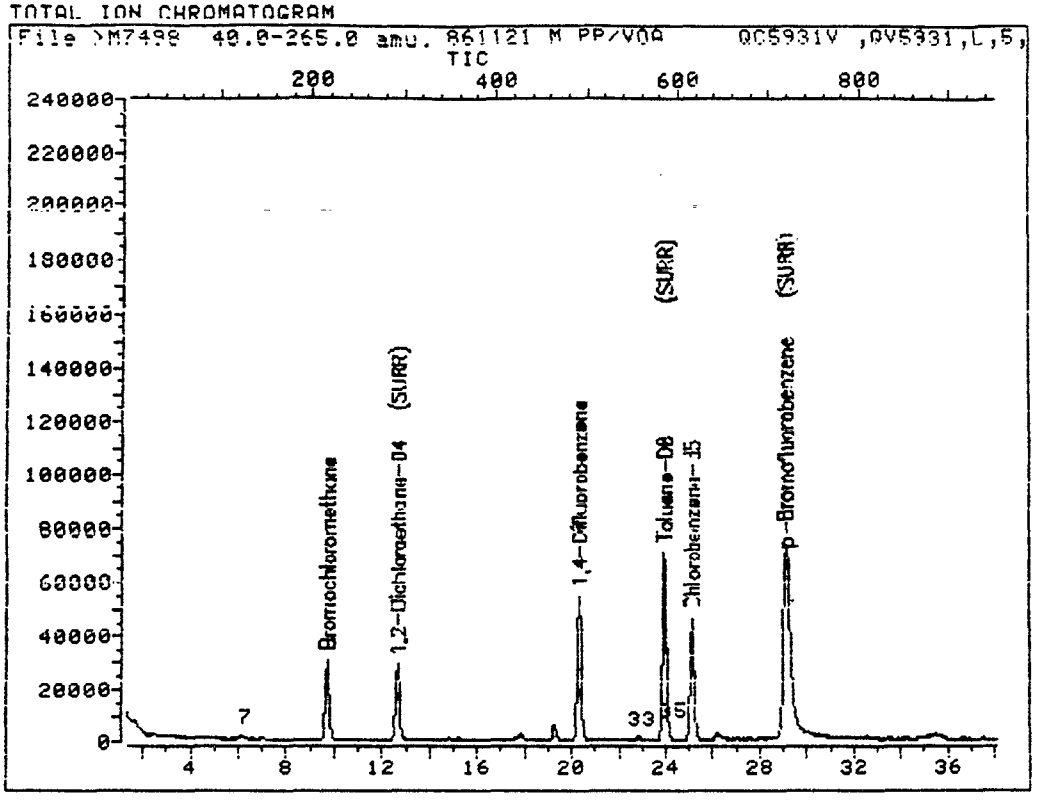
* Compound is ISTD

11/7/86

305230

Appendix C1
GC/MS Subsidiary Data

TOTAL ION CHROMATOGRAM



Data File: >M7498::U3 Quant Output File: ^M7498::AW
Name: 861121 M PP/VOA
Misc: QC5931V ,QV5931,L,5,5,

Id File: MVOA::US
Title: Volatile Priority Pollutant ID FILE
Last Calibration: 861121 12:01

Operator ID: JQ62/5
Quant Time: 861121 12:03
Injected at: 861121 06:18

305232

QUANT REPORT

Operator ID: JW6275 Quant Rev: 6 Quant Time: 861121 12:03
Output File: ^M/498::AQ Injected at: 861121 06:18
Data File: >M/498::U3 Dilution Factor: 1.00000
Name: 861121 M PP/VOA
Misc: QC5931V ,QV5931,L,5,5,

ID File: MVOA::US
Title: Volatile Priority Pollutant ID FILE
Last Calibration: 861121 12:01

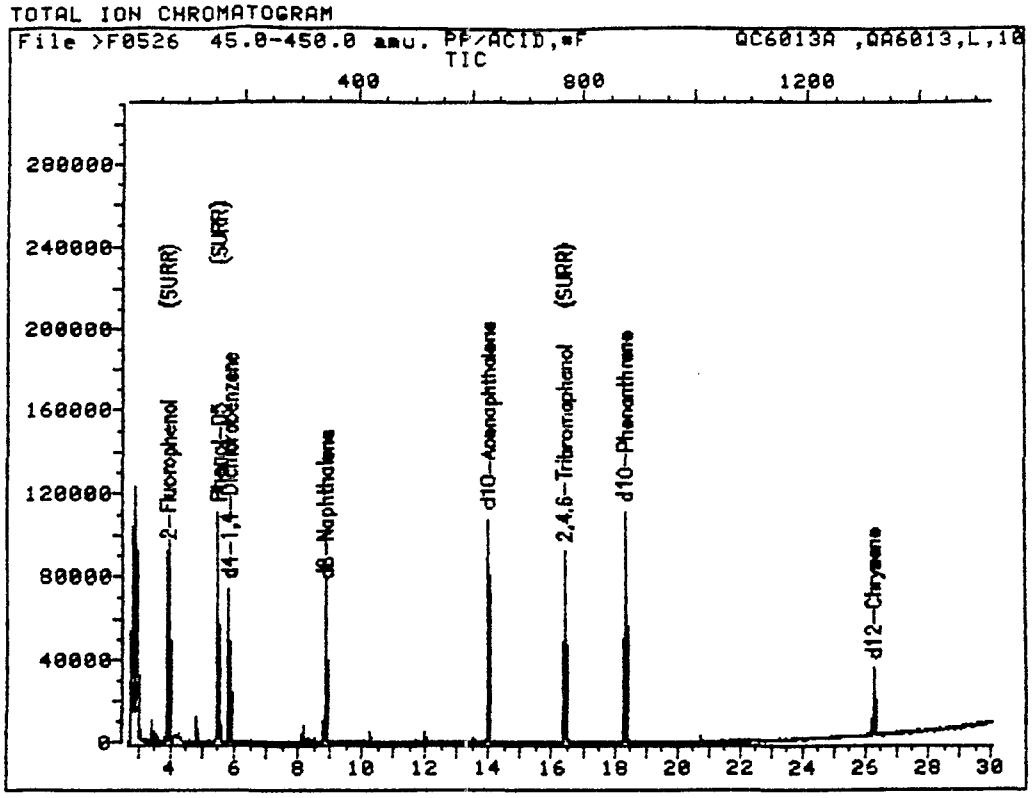
	Compound		R.T.	Scan#	Area	Conc	Units	q
1)	*Bromochloromethane		9.70	217	66376	250.00	NG	99
7)	Methylene chloride		6.18	126	2829	19.63	NG	86
16)	*1,4-Difluorobenzene		20.31	491	249275	250.00	NG	82
17)	1,2-Dichloroethane-D4	(SURR)	12.65	293	57076	259.74	NG	94
30)	*Chlorobenzene-d5		25.11	615	170859	250.00	NG	99
~~33)~~	~~Tetrachloroethylene~~		~~22.83~~	~~556~~	~~2829~~	~~6.08~~	~~NG~~	~~94~~
34)	Toluene-D8	(SURR)	23.95	585	307632	248.31	NG	91
~~35)~~	~~Toluene~~		~~24.15~~	~~590~~	~~1931~~	~~1.58~~	~~NG~~	~~92~~
38)	p-Bromofluorobenzene	(SURR)	29.10	718	181687	256.29	NG	97

* Compound is ISTD

SMC 11/24/86

305233

TOTAL ION CHROMATOGRAM



Data File: >F0526::U3 Quant Output File: ^F0526::AQ
Name: PP/ACID,#F
Misc: QC6013A ,QA6013,L,1000,1 BTL# 2

Id File: FACID::US
Title: PP/ACID IDFILE
Last Calibration: 861126 11:03

Operator ID: JA4996
Quant Time: 861126 13:17
Injected at: 861126 12:45

305234

QUANT REPORT

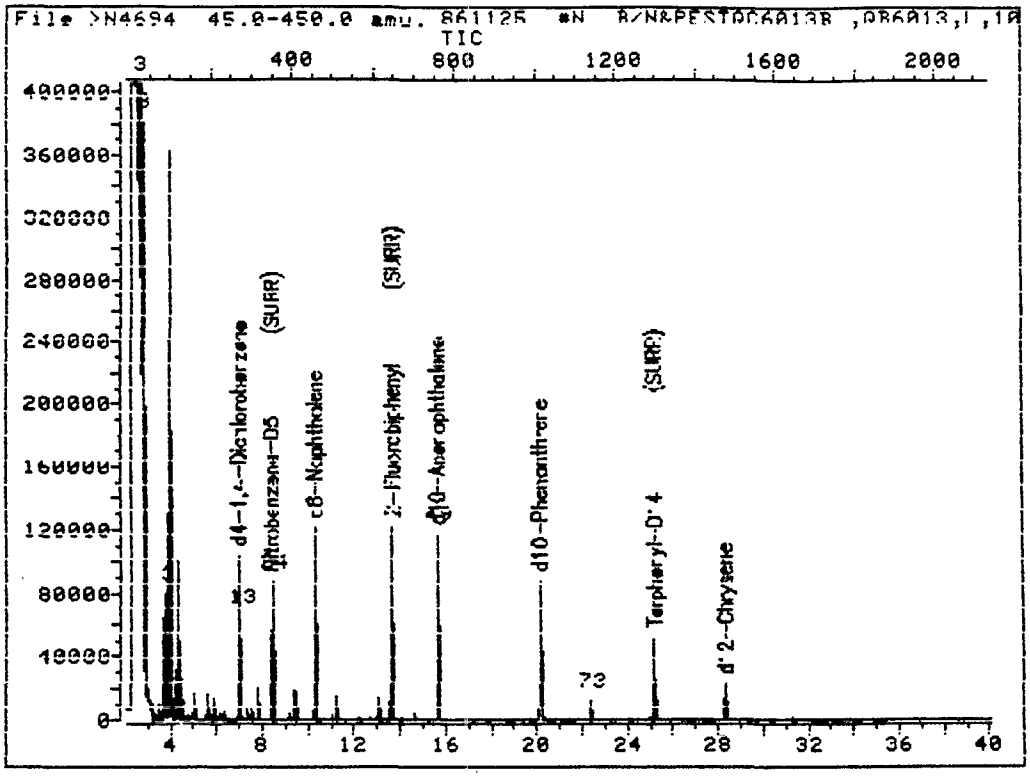
Operator ID: JA4996 Quant Rev: 6 Quant Time: 861126 13:17
Output File: ^F0526::AQ Injected at: 861126 12:45
Data File: >F0526::U3 Dilution Factor: 1.00000
Name: PP/ACID,#F
Misc: QC6013A ,QA6013,L,1000,1 BTL# 2

ID File: FACID::US
Title: PP/ACID IDFILE
Last Calibration: 861126 11:03

	Compound		R.T.	Scan#	Area	Conc	Units	q
1)	*d4-1,4-Dichlorobenzene		5.81	171	35658	40.00	UG/ML	89
3)	2-Fluorophenol	(SURR)	3.88	63	69006	108.10	UG/ML	76
9)	Phenol-D5	(SURR)	5.47	152	85528	87.66	UG/ML	96
12)	*d8-Naphthalene		8.83	340	86861	40.00	UG/ML	98
18)	*d10-Acenaphthalene		13.97	627	56444	40.00	UG/ML	97
25)	*d10-Phenanthrene		18.33	871	102168	40.00	UG/ML	99
26)	2,4,6-Tribromophenol	(SURR)	16.40	763	32589	84.42	UG/ML	97
29)	*d12-Chrysene		26.24	1313	29616	40.00	UG/ML	100

* Compound is ISTD

TOTAL ION CHROMATOGRAM



Data File: >N4694::U4 Quant Output File: ^N4694::AW
Name: 861125 #N B/N&PEST
Misc: WC6U13B ,WB6U13,L,1UUU,1 BIL#21

Id File: NBNP::U5
Title: B/N+PEST ID FILE
Last Calibration: 861126 12:44

Operator ID: KVU/86
Quant Time: 861126 16:26
Injected at: 861126 11:25

305236

QUANT REPORT

Operator ID: KVU786 Quant Rev: 6 Quant Time: 861126 16:26
Output File: ^N4694::AQ Injected at: 861126 11:25
Data File: >N4694::U4 Dilution Factor: 1.00000
Name: 861125 #N B/N&PEST
Misc: WC6U13B ,WB6U13,L,1000,1 BIL#21

ID File: NBNP::US
Title: B/N+PEST ID FILE:
Last Calibration: 861126 12:44

	Compound		R.T.	Scan#	Area	Conc	Units	q
1)	*d4-1,4-Dichlorobenzene		6.95	267	54441	40.00	UG/ML	98
3)	N-Nitrosodimethylamine		2.66	25	10063	~~11.24~~	~~UG/ML~~	100
3)	N-Nitrosodimethylamine		2.76	31	1340	~~1.50~~	~~UG/ML~~	100
3)	N-Nitrosodimethylamine		3.78	88	2107	~~2.35~~	~~UG/ML~~	100
12)	Nitrobenzene-D5	(SURR)	8.35	346	84430	41.40	UG/ML	83
13)	bis(2-Chloroisopropyl)ether		6.97	268	1836	~~6.80~~	~~UG/ML~~	74
21)	*d8-Naphthalene		10.25	453	144769	40.00	UG/ML	98
22)	2-Fluorobiphenyl	(SURR)	13.63	643	107010	40.47	UG/ML	97
24)	N-Nitrosodi-n-propylamine		8.35	346	12555	~~10.77~~	~~UG/ML~~	66
42)	*d10-Acenaphthalene		15.61	755	73999	40.00	UG/ML	97
49)	Dimethyl phthalate		15.61	755	18965	~~2.78~~	~~UG/ML~~	56
66)	*d10-Phenanthrene		20.11	1009	102784	40.00	UG/ML	96
68)	Di-n-butyl phthalate		22.31	1153	17098	5.13	UG/ML	97
80)	*d12-Chrysene		28.30	1471	25929	40.00	UG/ML	100
81)	Terphenyl-D14	(SURR)	25.18	1295	49419	63.93	UG/ML	94

* Compound is ISTD

WD
11/19/86

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Appendix D
Subcontractor's Data

1) A copy of the originating subcontractor's report is included for all data not generated within ETC's laboratory.

ETC ENVIRONMENTAL TESTING and CERTIFICATION

Subcontracted Analytical Results

REV

ETC Job # P1418152121

Lab ID: L861272-63

Submitted by: SN CHYUN

Date: 11-20-86

Facility: ____ (Facility Code) Sample Point: ____ – ____ (Source Code / Sample Point ID)

Date Sampled: ____ (Y Y M M D D) Time Sampled: ____ (H H : M M)

Line No.	Parameter	Table	Units Of Measure	Value	MDL	Comments
	CONVENTIONALS					
1	Chloride	QR 10	mg/l			
2	Fluoride	QR 10	mg/l			
3	Nitrate as N	QR 10	mg/l			
4	Sulfate as SO4	QR 10	mg/l	180	2	
5	Phenolics, Total	QR 10	mg/l			
6	Total Organic Halides (TOX)	QR 10	ug/l			
	Total Organic Halides (TOX)	QR 10	ug/l			
	Total Organic Halides (TOX)	QR 10	ug/l			
	Total Organic Halides (TOX)	QR 10	ug/l			
7	Total Organic Carbon	QR 10	mg/l			
	Total Organic Carbon	QR 10	mg/l			
	Total Organic Carbon	QR 10	mg/l			
	Total Organic Carbon	QR 10	mg/l			
8	Specific Conductance (Lab)	QR 10	um/cm			
	Specific Conductance (Lab)	QR 10	um/cm			
	Specific Conductance (Lab)	QR 10	um/cm			
	Specific Conductance (Lab)	QR 10	um/cm			
9	pH (Lab)	QR 10	std			
	pH (Lab)	QR 10	std			
	pH (Lab)	QR 10	std			
	pH (Lab)	QR 10	std			
10	Coliform, Total	QR 10	C/100			
11	Coliform, Fecal	QR 10	C/100			
12	Gross Alpha	QR 10	PCi/l			
13	Gross Beta	QR 10	pCi/l			
14	Acidity as CaCO3		mg/l			
15	Alkalinity as CaCO3		mg/l			
16	Ammonia as N		mg/l			
17	Bicarbonate as CaCO3		mg/l			
18	Biochemical Oxygen Demand		mg/l			
19	Carbonate as CaCO3		mg/l			
20	Chemical Oxygen Demand		mg/l			
21	Color, Apparent (Lab)		Pt/Co			
22	Cyanide, Total		mg/l			
23	Hardness as CaCO3		mg/l			
24	Nitrite as N		mg/l			
25	Nitrogen Total Kjeldahl (TKN)		mg/l			
26	Nitrogen, Total Organic		mg/l			
27	Odor (Lab)		TON			
28	Oil and Grease (grav, IR)		mg/l			
29	Phosphate, ortho		mg/l			
30	Phosphate, Total		mg/l			
31	Solids, Total		mg/l			
32	Solids, Total Dissolved (ROE) 180°		mg/l			
33	Solids, Total Suspended		mg/l	17,300	2	
34	Sulfide as S		mg/l			
35	Surfactants (MBAS/LAS)		mg/l			
36	Turbidity (Lab)		NTU			

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Appendix E

Chain-of Custody Forms

1. A field Chain-of-Custody form (COC) is included for all samples shipped by ETC shuttle.

2. An in-house sample Chain-of Custody form is included for all samples not shipped by ETC shuttle.

3. Any additional Chain-of-Custody material provided by a client or by a client's sampling agent is also included.

4. A subcontractor's Chain-of-Custody form is included for any analytical work not performed within ETC's laboratory.

5. Analysis and Extraction Custody forms are included for the period the sample was in ETC's possession.

ETC ENVIRONMENTAL TESTING and CERTIFICATION — ORIGINAL

CHAIN OF CUSTODY FORM (CC1)

Seal No. 67751 ETC Job # P4852

Date Sealed 6 NOV. 1986 By: M.I.

Company: HELLERTOWN MANUFACTURING Attn.: MARK SCHULTZ

Facility/Site: C/O GUARD OFFICE-SILVER ROAD Phone:

Address: HELLERTOWN, PA. 18055

SAMPLE IDENTIFICATION

Facility: CHAMPION (Facility/Site Code) (Optional Sample Point Descriptions)

Sample Point: W-GSP-3 (Source Code (from below) / Your Sample Point ID (left justify)) 861110 (Start Date (YY/MM/DD)) 1400 (Start Time (2400 hr. clock)) (Elapsed Hours (composite))

861110 MB861113

Source Codes:

Well ..(W) Outfall.....(O) Bottom Sediment....(B) Surface Impoundment....(I) Leachate Collection Sys.....(C) Other .....(X)

Soil ...(S) River/Stream..(R) Generation Point ....(G) Treatment Facility .....(T) Lake/Ocean .....(L) Specify

SHUTTLE CONTENTS

BOTTLE No	Type	Size	Preserv.	ANALYSIS	SAMPLER Filt. (Y/N)	SAMPLER Observations	LAB Observations
1	M	500 ML	HNO3	METALS			✓
1	PN	125 ML	H2SO4	PHENOLS			✓
1	B	125 ML	H2SO4	NITRATE			✓
1	CN	125 ML	NAOH	CYANIDE			✓
1	A	500 ML	BAKED	SOLIDS, TD/SULFATE			✓
1	D	500 ML	DI RINSE	FLUORIDE			✓
2	V	40 ML	SOD. THIOL.	VOA			✓
3	E	1 L	BAKED	EXTRACTABLES			✓
1	TB	40 ML	GC/MS H2O	TRIP BLANK			✓

CHAIN OF CUSTODY CHRONICLE

1. Shuttle Opened By: (print) M. SCHULTZ Date: 11-10-86 Time:
   Signature: Mark Schultz Seal #: Intact:
2. I have received these materials in good condition from the above person.
   Name: Signature:
   Date: Time: Remarks:
3. I have received these materials in good condition from the above person.
   Name: Signature:
   Date: Time: Remarks:
4. Shuttle Sealed By: (print) M. SCHULTZ Date: 11-10-86 Time: 16:30
   Signature: Mark Schultz Seal #: 067752 Intact:

LAB USE ONLY Opened By: Mark Schultz Date: 11/11/86 Time: 5:20PM 205941

SHUTTLE # 1165 TEMP. °C 12 SEAL # 67752 COND. TITART

ETC ENVIRONMENTAL TESTING and CERTIFICATION

FIELD PARAMETER FORM (CC2)

ETC JOB # P4852

Sample Point W (Source Code) CISP1-3 (Sample Point I.D)

FIELD PROCEDURES

PURGE DATE (YY MM DD) | START PURGE (2400 Hr Clock) | ELAPSED HRS | WATER VOL. IN CASING (Gallons) | VOLUME PURGED (Gallons)

SAMPLING METHOD: _____

Sampler Type [ ] A-Submersible Pump, B-ISCO, C-Bladder Pump, D-Dipper/Bottle, E-Bailer, F-Scoop/Shovel, X-Other _____ (SPECIFY OTHER)

Sampler Material [ ] A-Teflon, B-Metal, C-PVC, D-Plastic, X-Other _____ (SPECIFY OTHER)

Tubing Material [ ] A-Teflon, B-Tygon, C-Polyethylene, D-Silicon, X-Other _____ (SPECIFY OTHER)

Sample Composited [Y/N] _____ Procedure/Proportions

FIELD MEASUREMENTS

Well Elevation (ft/msl) _____ Well Depth (ft) _____

Depth to Ground water (ft) _____ Sample Depth (non-well) (ft) _____

Groundwater Elevation (ft msl) _____

	ph	(STD)	spec. cond.	um/cm at 25° C	(other parameter)	value	units
1st		(STD)		um/cm at 25 °C			
2nd		(STD)		um/cm at 25 °C			
3rd		(STD)		um/cm at 25 °C			
4th		(STD)		um/cm at 25 °C			

Sample Temp _____ (°C) Turbidity _____ NTU

FIELD COMMENTS

Sample Appearance: _____

Weather Conditions: _____

Other: _____

FILTERING: Use Chain of Custody (CC1) to indicate which bottles were filtered

Sampler: _____ (Print) Employer: _____

I certify that sampling procedures were in accordance with applicable EPA state and corporate protocols.

(Signature: _____

305242

ORIGINAL

ETC ENVIRONMENTAL TESTING and CERTIFICATION

LABORATORY CHRONICLE: GC-MS Department

DATE 861121 SHIFT
FRACTION VOA
INSTRUMENT M
TUNE FILE APETO2
SEQUENCE FILE 1QM
METHOD FILE VOAM
ID FILE MVOA
ANALYST(S) [signatures]
SUPERVISOR [signature]
BATCH #'s QV5931

STANDARD	CONC PPM	LOT NO.	LOT VOL.
p-BFB	50	13795	1
Internal std E	25	13747	10
Surrogate	25	14671	10
ABC/XVOA	18	14664A	5,10,30

(PLEASE INITIAL)

CURRENT CS05 STATUS		STANDARDS UPDATED	
ACQ		DATE	861121
WIP		BY	D. Fallant

NAME	DATA FILE	uL INJ	ALS #	DIL	TAPE #	SPECIALS (WRITE A-TYPE)	PLUS Y/N
p-BFB	>M7497	1ul					
QC5931V	>M7498	5ml	1			06:18	
QC5931VS	>M7499	↓	2		CBUPD	5ul ABC/XVOA	
QC5931VS	>M7500		3		CBCAL	10ul ABC/XVOA	
QC5931VS	>M7501	↓	4			30ul ABC/XVOA 08:43	
p-BFB	>M7502	1ul			OK	09:32	
P4240VS	>M7503	5ml	1		OK		
P4240V	>M7504		2		OK		
P4241VR	>M7505		3		OK		
P4241V	>M7506	↓	4		OK		
P4242V	>M7507	5ml	5		OK		
P4243V	>M7508		6		OK		
P4244V	>M7509		7		OK		
P4236V	>M7510		8		OK		
P4237V	>M7511	↓	9		OK		
② P4239V	>M7512	0.001	10	1:5000		Too Dilute Rerun 1:500	
p-BFB	>M7513	1ul					
QC5931VS	>M7514		10		OK	5ul ABC/XVOA	
② P4239V	>M7515	0.01	1	1:500	OK	For Benzene	
P4235V	>M7516	5ml	2		OK		
P5336V	>M7517		3		OK		
P5415V	>M7518	↓	4		OK		
P5414V	>M7519	0.1ml	5	1:50	OK		
P4850V	>M7520	5ml	6		OK		
P4851V	>M7521	↓	7		OK		

ETC ENVIRONMENTAL TESTING and CERTIFICATION

LABORATORY CHRONICLE: GC-MS Department

DATE 861122 SHIFT
FRACTION VOA
INSTRUMENT 5m
TUNE FILE BFB102
SEQUENCE FILE 10m
METHOD FILE VOA5m
ID FILE mVOA
ANALYST(S) J. Quinn
SUPERVISOR Kapernick
BATCH #'s QV5931

(PLEASE INITIAL)

CURRENT CS05 STATUS		STANDARDS UPDATED	
ACQ		DATE	
WIP		BY	

STANDARD	CONC PPM	LOT NO.	LOT
PAGE 2 of 2			

NAME	DATA FILE	uL INJ	ALS #	DIL	TAPE #	SPECIALS (WRITE A-TYPE)	PL Y/
P4852V	>m7522	5ml	8		OK		
P4853V	>m7523	↓	9		NG	rerun carryover	
			~~10~~				

305244

ETC FORM #102

ETC ENVIRONMENTAL TESTING and CERTIFICATION

LABORATORY CHRONICLE: Sample Preparation Department

Sample Number	Log Link	Sample Vol. (ml)	Extract Vol. (ml) BN	Extract Vol. (ml) ACID	Comments
P0447	17862	1000	1.0	1.0	PAH/Chlor/Pest/PCB's
P0448		1000	1.0	1.0	
P0449		1000	1.0	1.0	
P0450		1000	1.0	1.0	
P0457		1000	1.0	1.0	
P0458		1000	1.0	1.0	
P0467		1000	1.0	1.0	
P0468		1000	1.0	1.0	
P0471		1000	1.0	1.0	
~~P0472~~		~~995~~	~~1.0~~		
P0489	17863	1000	1.0	1.0	PP/T
P0493		980	1.0	1.0	
P0494		1000	1.0	1.0	
P0495		1000	1.0	1.0	
P4852	17866	930	1.0	1.0	PAH/Chlor/Pest/PCB's
P4853		930	1.0	1.0	
P0472	17862	1000		1.0	
QC 6013		1000	1.0	1.0	
QC 6013 S		1000	1.0	1.0	
P0447 S		980	1.0	1.0	
P0448 R		995	1.0	1.0	

QC Batch # 6013

Analysis SEE COMMENTS

Matrix H_2O

Turnaround NORM

Date 11/17/86

Extraction Method:

Sep. Funnel ✓ K.B. 11-17-86

Continuous BN ON: 11:00 AM 11-17-86 OFF BN ON 11:30 AM 11-18-86

Soxhlet ACID ON: 1:00 PM 11/18/86 OFF: 1:00 PM 11/19/86

Other

COMMENTS

Ⓐ P0472 - Acid fraction lost during conc., Reported using a separate aliquot

FRACTION	SPIKE Amt (ml)	SPIKE Conc. (ug/ml)	SPIKE Lot #
PP/BN	1.0	100	13,929
PP/ACID	1.0	100	13,829
Chlordane 1260	1.0	100	14,404
Pesticide	1.0	100/200	14,631
Semi-VOA			

BC Vol. Used

SURROGATE Amt. (ml)	Conc. (ug/ml)	Lot #
	BN's - 50	14,597
1.0	ACID's - 100	

Set-up: K. Boyle 11-17-86 Doug Mazurek 11-17-86

Conc.: K. Boyle 11-24-86

UPD/Supervisor: [signature] 11-25-86

Spike/Surr. Verified: Kenneth Boyle 11-17-86

p 1/2

ETC ENVIRONMENTAL TESTING and CERTIFICATION

LABORATORY CHRONICLE: GC-MS Department

DATE 1-20-86 SHIFT
FRACTION PA/ACID
INSTRUMENT F
TUNE FILE MTF001
SEQUENCE FILE JAFI/JAF
METHOD FILE AUDF
ID FILE FACID
ANALYST(S) J. Ao
SUPERVISOR Stapanuch
BATCH #'s QA 6013
QA 6056
(PLEASE INITIAL)

CURRENT CS05 STATUS		STANDARDS UPDATED	
ACQ		DATE	
WIP		BY	

STANDARD	CONC PPM	LOT NO.	LOT VOL.
PP/ACID STD	300	14429	
↓	100	14428	
	60	14427	
Int. STD	400	14585	
Test MIX		14616	

Page 1 of 3

NAME	DATA FILE	uL INJ	ALS #	DIL	TAPE #	SPECIALS (WRITE A-TYPE)	PLUS Y/N
Column Test mix	> F0520					OK	
300 ppm PP/ACID STD	> F0521					← CBUPP (JA)	
100 ppm PP/ACID STD	> 0522					← CBCAL	
60 ppm PP/ACID STD	> 0523					←	
Column Test mix	> 0524				11:04	OK	
QC 6013 AS	> 0525		1				
QC 6013 A	> 0526		2				
P0447 AS	> 0527		3				
P0447 A	> 0528		4				
P0448 A	> 0529		5				
P0448 AR	> F0530		6				
P0449 A	> 0531		7				
P0450 A	> 0532		8				
P4852 A	> 0533		9				
P4853 A	> 0534		10				
P0457 A	> 0535		11				
P0458 A	> 0536		12				
P0467 A	> 0537		13				
P0468 A	> 0538		14				
P0471 A	> 0539		15				
P0472 A	> F0540		16				
Column Test mix	> 0541		17		22:39		
100 ppm PP/ACID STD	> 0542		18			OK	
P0489 A	> 0543		19				
P0493 A	> F 0544		20				

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ETC ENVIRONMENTAL TESTING and CERTIFICATION

LABORATORY CHRONICLE: GC-MS Department

DATE 11-20-87 SHIFT
FRACTION PP/ACID
INSTRUMENT F
TUNE FILE MT7001
SEQUENCE FILE DAT11JAT
METHOD FILE ACID7
ID FILE 7ACID
ANALYST(S) JAD
SUPERVISOR Stapleton
BATCH #'s

(PLEASE INITIAL)

CURRENT CS05 STATUS		STANDARDS UPDATED	
ACO		DATE	
WIP		BY	

STANDARD	CONC PPM	LOT NO.	LOT VOL.

page 30 of 47

NAME	DATA FILE	uL INJ	ALS #	DIL	TAPE #	SPECIALS (WRITE A-TYPE)	PLUS Y/N
P0496A	>Forest		21				
P0495A	0546		22				
QC6056AS	0547		23				
QC6056A	0548		24				
P5831AS	0549		25				
P5831A	>F0550		26				
P5832A	0551		27				
P5832AR	0552		28				
P5817A	0553		29				
P5818A	0554		30				
P5822A	0555		31				
P5823A	0556		32				
P5825A	0557		33				
P5826A	0558		34				
Column Test mix	0559		35			10:19 OK	
100ppm PP/ACID STD	>F0560		36			OK	
P5827A	0561		37				
P5828A	0562		38				
P5829A	0563		39				
P5830A	0564		40				
P4976A	0565		41				
P5816A	0566		42	1:5			
P5821A	0567		43				
P5824A	0568		44				
P5820A	0569		45				

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11-30

ETC ENVIRONMENTAL TESTING and CERTIFICATION

LABORATORY CHRONICLE: GC-MS Department

DATE Nov. 26 86 SHIFT
FRACTION B/N
INSTRUMENT "N"
TUNE FILE
SEQUENCE FILE XV25
METHOD FILE BNPN; ACIDN
ID FILE N3N2
ANALYST(S) K. Valach

SUPERVISOR [signature]
BATCH #'s QB6057; QB6013

(PLEASE INITIAL)

CURRENT CS05 STATUS		STANDARDS UPDATED	
ACO		DATE	Nov. 26 1986
WIP		BY	KV

STANDARD	CONC PPM	LOT NO.	LOT VOL
Test. IV	150	14433	
B/N II	200	14432	
B/N II	100	14713	
B/N I	60	14430	
Aniline	300	13466	
Aniline	100	13469	
Aniline	60	12470	
2-Picoline	300	14411	
2-Picoline	100	14412	
2-Picoline	60	14413	
Methoxyaniline	300	14352	
Methoxyaniline	100	14353	
Methoxyaniline	60	14354	
Int. Std.	400	14585	
Col Test Mix	25	14616	

NAME	DATA FILE	uL INJ	ALS #	DIL	TAPE #	SPECIALS (WRITE A-TYPE)	PLUS Y/N
Col Test-Mix	>N4673					OK 14:37	
Test col. std. IV; 150ppm	>N4674		1				
B/N cal std. II; 200ppm	>N4675		2				
B/N cal std. II; 100ppm	>N4676		3				
B/N cal std. I; 60ppm	>N4677		4				
Aniline std.; 300ppm	>N4678		5				
Aniline std.; 100ppm	>N4679		6				
Aniline std. 60ppm	>N4680		7				
2-Picoline Methoxy aniline std; 300ppm	>N4681		8				
2-Picoline Methoxyaniline std.; 100ppm	>N4682		9				
2-Picoline Methoxy aniline std.; 60ppm	>N4683		10			OK	
Col. Test-Mix	>N4684		11			OK 03:17	
QC6057BS	>N4685		12			AN1260	
P2712BS	>N4686		13			AN1260	
QC6057B	>N4687		14			PCBSCN S	Y
P2711B	>N4688		15			S	Y
P2711BR	>N4689		16				
P2712B	>N4690		17			S	Y
N6321B	>N4691		18			S	Y
QC6013BS	>N4692		19			AN1260	
P0447BS	>N4693		20			AN1260	
QC6013B	>N4694		21			PCBSCN	
Col. Test-Mix	>N4695		22			OK 12:15	
B/N cal. std. II; 100ppm	>N4696		23			AN1260; OK	
P2711B	>N4697		24			PCBSCN	

AH 11 30

ETC ENVIRONMENTAL TESTING and CERTIFICATION

LABORATORY CHRONICLE: GC-MS Department

DATE 11/26/86 SHIFT _____
FRACTION BNP
INSTRUMENT N
TUNE FILE _____
SEQUENCE FILE _____
METHOD FILE _____
ID FILE _____
ANALYST(S) L. Valenti
SUPERVISOR [signature]
BATCH #'s QB6057, QB6013

(PLEASE INITIAL)

CURRENT CS05 STATUS		STANDARDS UPDATED	
ACQ		DATE	
WIP		BY	

STANDARD	CONC PPM	LOT NO.	LOT VOL.

NAME	DATA FILE	uL INJ	ALS #	DIL	TAPE #	SPECIALS (WRITE A-TYPE)	PLUS Y/N
PC448B	>N4698		25			PCBSCN	
PC448BR	>N4699		26				
PC449B	>N4700		27				
PC45CB	>N4701		28				
PC457B	>N4702		29				
PC458B	>N4703		30				
PC467B	>N4704		31				
PC468B	>N4705		32				
Col. Test-Mix	>N4706		33			OK 21:29	
3 Nical. Std. II, 100ppm	>N4707		34			AN1260	
PC471B	>N4708		35			PCBSCN	
PC472B	>N4709		36				
PC489B	>N4710		37				
PC493B	>N4711		38				
PC494B	>N4712		39				
PC495B	>N4713		40				
P4852B	>N4714		41				
P4853B	>N4715		42				
Col. Test-Mix	>N4716		43				

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ETC ENVIRONMENTAL TESTING and CERTIFICATION

CONVENTIONAL CHEMISTRY LAB

Analyzed on: 11/26/86

TEST: Fluoride, UNITS: mg/L, BY: Ckerman

Meth. Ref. #: STD METHOD 413E, MDL: 0.10, Book # CV-12 P. 108

Instrument #: A.A. Channel 7, From Page #: 107

Log Link	Job #	Analyzed Conc.	Diln	Reported Conc.	Log Link	Job #	Analyzed Conc	Diln	Reported Conc
17455	N0831	0.07	–	BMDL	17828	P2472	0.03	–	BMDL
17455	M0703	0.26	10x	2.60	17828	P2473	0.03	–	BMDL
17455	M0704	0.27	10x	2.70	17828	P2522	0.08	–	BMDL
17455	M0705	0.23	10x	2.30	17828	P2536	0.03	–	BMDL
17455	M0706	0.28	10x	2.80	17828	P2548	0.02	–	BMDL
17455	M0707	0.23	10x	2.30	17866	P4850	0.16	–	0.16
17455	M0708	.003	–	BMDL	17866	P4851	0.21	–	0.21
17514	N6032	0.44	–	0.44	17866	P4852	2.24	–	RPT
17514	N6033	0.54	–	0.54	17866	P4853	0.98	–	0.98
17749	P2500	0.01	–	BMDL	17250	N9520	1.64	–	1.64
17749	P2513	0.07	–	BMDL	17441	P2237	0.07	–	BMDL
17749	P2514	0.03	–	BMDL	17878	P2776	0.087	–	BMDL
17749	P2515	0.07	–	BMDL	17864	P2481	.006	–	BMDL
17749	P2526	0.04	–	BMDL	17864	P2531	0.02	–	BMDL
17778	P2497	0.03	–	BMDL	17864	P2541	0.04	–	BMDL
17778	P2499	0.03	–	BMDL	17864	P2546	0.02	–	BMDL
17778	P2507	0.13	–	0.13	17864	P2554	0.01	–	BMDL
17778	P2517	0.12	–	0.12					
17798	P2469	0.03	–	BMDL					
17798	P2477	0.05	–	BMDL					
17798	P2524	0.08	–	BMDL					
17798	P2538	0.05	–	BMDL					
17798	P2539	0.04	–	BMDL					
17798	P2540	0.02	–	BMDL					

STANDARDS

Preped on ______

By ______

From ______ mg/L

Stock # ______

Standard mg/L	Value Obtained	% of Theoretical

Slope	Intercept	Corr. Coef

ADDITIONAL COMMENTS

RPT:
N9319 – Over 2 ml
P4852 – and excessive instrument noise
Dilute 1:10 and check

Analyses QA/QC Data Report — See CV-12, p 107.

QC Batch #: F1001 + FL003

Verified: [signature] 11/28/86

METHOD BLANK		
Spiked Blank (Known)		
Spiked Blank Result		
% Recovery		
EXTERNAL REF. QC		
Known Value		
Observed Result		
% Recovery		

PRECISION	
Job # Dup (ETC)	P2472
Original Result	.0297
Duplicate Result	.0339
R Range	.0042
ACCURACY	
Job # Spiked (ETC)	P2472
Original Result	.0318
Amount Spiked	1.00
Spiked S' Result	1.07
% Recovery	104 %

To Page No. ______

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ETC ENVIRONMENTAL TESTING and CERTIFICATION

CONVENTIONAL CHEMISTRY LAB

TEST: Nitrite, UNITS: mg/l, ANALYZED ON: 11-22-86

METH. REF. #: 353.2, MDL: 0.10, BY: S.T.

INSTRUMENT #: #1 (Channel 2), BOOK # CV-12 P. 100

39 FROM PAGE #: ____

Log Lnk	Job #	Analyzed Conc.	Dilu	Reported Conc.
17524	N6110	0		BMDL
17529	N6120	.0028		BMDL
17529	N6126	.0040		BMDL
17531	P2710	.0024		BMDL
17531	P2725	0		BMDL
17539	P2117	.0043		BMDL
17539	P2116	.0954		BMDL
17539	P2119	.0571		BMDL
17524	P1711	.0043		BMDL
17524	P1713	.0040		BMDL
17524	P1714	0		BMDL
17524	P1717	.00119		BMDL
17562	N6128	0		BMDL
17562	N6148	.00119		BMDL
17523	P2717	0		BMDL
17579	P2726	.118		.12
17584	P3068	.100		.10
17503	P2683	.121		.12
17562	N6122	.00357		BMDL
17524	P1715	.00213		BMDL
17864	P2581	.00119		BMDL
17864	P2541	.0611		BMDL
17864	P2546	.0691		BMDL
17864	P2557	.0028		BMDL

Log Lnk	Job #	Analyzed Conc	Dilu	Reported Conc
17866	P4850	.00151		BMDL
17866	P4851	.0166		BMDL
17866	P4852	.0490		BMDL
17866	P4853	.0446		BMDL
17878	P2776	.00181		BMDL
17866	P3120	.00114		BMDL
17866	P3122	0		BMDL
17866	P3124	.0164		BMDL
17866	P3126	0		BMDL
17882	P2543	.00473		BMDL
17882	P2544	.00213		BMDL
17882	P2545	.00473		BMDL
17882	P2547	.00784		BMDL
17882	P2549	.00119		BMDL
17886	P3117	.0066		BMDL

STANDARDS

PREPED ON ____

BY ____

FROM ____ mg/L

STOCK# ____

STANDARD mg/L	VALUE OBTAINED	% of Theoretical
1.00	.99	99 %
0.50	.51	102 %
0.20	.197	98.5 %
0.05	.046	92%

SLOPE	Intercept	Corr. Coef.
.0120	-.0005	.9998

ADDITIONAL COMMENTS

ALL Calculations By $X = mY + B$.

Analyses QA/QC Data Report

QC Batch # (P3004 NO_2)

Verified: 11/24/86

PRECISION

METHOD BLANK	.00337	
Spiked Blank (Known)	.20	
Spiked Blank Result	.198	
% Recovery	99	
EXTERNAL REF. QC	N/A	DS
Known Value		.5
X Observed Result		-532
X % Recovery		

Job # Dup (ETC)	N6110	P1714					
Original Result	0	0					
Duplicate Result	0	.0015					
R Range	0.0	.0015					
ACCURACY							
Job # Spiked (ETC)		P1714					
Original Result		0					
Amount Spiked		.0262					
Spiked S' Result							
% Recovery		1.31					

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To Page No. ____

ETC ENVIRONMENTAL TESTING and CERTIFICATION

CONVENTIONAL CHEMISTRY LAB

ANALYZED ON: 11-24-86

TEST: NITRATE, UNITS: mg/l,

METH. REF. #: 353.2, MDL: 0.10, 37

INSTRUMENT #: #1 (Channel 2),

BY: CH

BOOK # CV-12 P. 48

FROM PAGE #: ____

LogLink	Job #	ANALYZED CONC.	Dilu	REPORTED CONC.
.7798	P2469	over		*
.7798	P2477	over		*
.7798	P2524	over		*
.7798	P2538	over		*
7798	P2539	over		*
7798	P2540	over		*
7814	P3555	.487	-	.49
7822	P3107	over		*
17822	P3112	.007		BmDL
17828	P2473	over		*
.7828	P2472	over		*
17828	P2522	over		*
17828	P2536	over		*
17828	P2548	over		*
17864	P2481	.006		BmDL
17864	P2531	.0245		BmDL
17864	P2541	1.73		1.73
17864	P2546	over		*
17864	P2554	2.06		2.06
17866	P4850	over		*
17866	P4851	over		*
7866	P4852	.398		.40
7866	P4853	over		*
17878	P2770	.0462		BmDL

LogLink	Job #	ANALYZED CONC	Dilu	REPORTED CONC
17886	P3117	1.15		1.15
17866	P3120	.0207		BmDL
17866	P3122	.0511		BmDL
17866	P3124	.0173		BmDL
17866	P3126	.0127		BmDL
17882	P2543	over		*
17882	P2544	.0250		BmDL
17882	P2545	over		*
17882	P2547	over		*
17882	P2549	over		*
17882	P2550	over		*
17882	P2551	over		*
17882	P2552	over		*

STANDARDS

PREPED ON ____

BY ____

FROM ____ mg/L

STOCK# ____

STANDARD mg/L	VALUE OBTAINED	% of Theoretical
2.00	1.98	
1.00	1.04	
.50	.497	
.20	.0934	
SLOPE	Intercept	Corr. Coef.

ADDITIONAL COMMENTS

* RPS on CHannel 1

Complete Page 97

Analyses QA/QC Data Report

QC Batch # NC003

Verified: 11/24/86

METHOD BLANK	.003	.0177	
Spiked Blank (Known)	.5	.5	
Spiked Blank Result	.501	.532	
% Recovery	160%	1.06	
EXTERNAL REF. QC	EPA		
Known Value	93		
X Observed Result	953		
X % Recovery	1.02		

PRECISION

Job # Dup (ETC)	P2473	P4850	P3126
Original Result	over	over	.0217
Duplicate Result			.0194
R Range	↓	↓	
ACCURACY			
Job # Spiked (ETC)	P2473	P4850	P3126
Original Result	over	over	.021
Amount Spiked			.5
Spiked 5' Result	↓	↓	.506
% Recovery			97%

80525

To Page No. ____

ETC ENVIRONMENTAL TESTING and CERTIFICATION

CONVENTIONAL CHEMISTRY LAB

ANALYZED ON: 12-3

TEST: Cyanide, UNITS: mg/l,
METH. REF. #: 335.3, MDL: 0.025,
INSTRUMENT #: #1 (Channel 1),

BY: C.H.
BOOK # CV-12 P. 119
FROM PAGE #: ____

Log Link	Job #	Analyzed Conc.	Dilu	Reported Conc.	Log Link	Job #	Analyzed Conc	Dilu	Reported Conc
17837	N4709	0		BmDL	17697	P4748	.005		BmDL
17837	N4714	0		BmDL	17697	P4748	.004		BmDL
17863	P0489	-.007		BmDL	17697	P4748	.004		BmDL
17863	P0493	-.009		BmDL	17698	P1710	.003		BmDL
17863	P0494	.005		BmDL	17701	N4710	.004		BmDL
17863	P0495	-.002		BmDL	17701	N4715	.004		BmDL
17866	P4850	.539		.539	17866	P4851	over		REDO
17868	P4510	*		Redo	17866	P4852	over		REDO
17878	P2776	.007		BmDL	17866	P4853	*		Redo
17881	P1865	.002		BmDL	17868	P4510	*		Redo
17883	N4708	.002		BmDL	17868	P4511	*		Redo
17883	N4711	.003		BmDL	17868	P4512	*		Redo
17833	P4241	.0197		BmDL	17868	P4513	*		Redo
17833	P4242	.0169		BmDL	17883	N4712	*		Redo
17833	P4243	.0211		BmDL	17883	N4713	*		Redo
17833	P4244	.0186		BmDL	17889	P2754	*		Redo
17834	P4248	.0185		BmDL	17889	P2761	*		Redo
17834	P4244	.0189		BmDL	17889	P2774	*		Redo
17834	P4250	.0231		BmDL	17889	P2775	*		Redo
17834	P4251	.0189		BmDL	17833	P4235	*		Redo
~~——~~	~~P2724~~	~~.026~~		~~BmDL~~	17833	P4226	*		Redo
17693	P2916	.0185		BmDL	17833	P4237	*		Redo
17693	P2917	.0312		BmDL	17833	P4238	*		Redo
17697	P4748	.006		BmDL	17833	P4239	*		Redo

STANDARDS

PREPED ON 12-2
BY D.B.
FROM ____ mg/L
STOCK #: ____

STANDARD mg/L	VALUE OBTAINED	% of Theoretical
.500	.493	98.6%
.400	.405	101.%
.200	.205	102.5%
.100	.102	102%

SLOPE	Intercept	Corr. Coef.

ADDITIONAL COMMENTS

* RPT DUE TO INSTRUMENTATION problem
P4851 10x
P4852 20x

Analyses QA/QC Data Report

QC Batch # CY003

Verified: 12/3/86

METHOD BLANK	.008	
Spiked Blank (Known)	.100	
Spiked Blank Result	.103	
% Recovery	103%	
EXTERNAL REF. QC	EPA	
Known Value	.224	
X Observed Result	.228	
X % Recovery	101.7%	

PRECISION

Job # Dup (ETC)	N4709	P4748
Original Result	0	0.006
Duplicate Result	0	0.005
R Range	0.0	0.001

ACCURACY

Job # Spiked (ETC)	N4709
Original Result	0.0
Amount Spiked	.200
Spiked S' Result	.201
% Recovery	99%

To Page No. 205253

ETC ENVIRONMENTAL TESTING and CERTIFICATION

CONVENTIONAL CHEMISTRY LAB

TEST: Phenol, UNITS: mg/l,
METH. REF. # 420.2, MDL: .050,
INSTRUMENT # AA Channel #1,

ANALYZED ON: 11/29/86
BY: L. Herman / R. Hulit
BOOK # CV-12 P. 115
FROM PAGE # 114

Log Lnk	Job #	Analyzed Conc.	Dilu	Reported Conc.
17539	P2121	0.037	X10	.375
↓	P2123	0.043	STR	BMDL
17543	P4131	"	X10	STR RPT
17584	P3067	0.013	—	BMDL
17639	N9882	"	X5	1:100 RPT
17681	N9884	"	X5	1:100 RPT
	N9880	"	X5	1:50 RPT
↓	P2614	"	X5	STR RPT
17696	P0582	"	—	STR. RPT
17824	P4480	"	X5	1:10 RPT
17828	P2472	"	X5	RPT
17864	P2537	"	X5	RPT
17868	P4512	"	X5	RPT
17869	P4851	0.067	X5	0.335
17869	P2554	0.017	—	BMDL
17869	P4851	0.013	—	BMDL
	P4852	0.017	—	BMDL
↓	P4853	0.022	—	BMDL
17886	P5124	0.128	X10	1.28
17707	N8072	0.048	—	BMDL
↓	N8075	0.027	—	BMDL
17721	N8674	0.131	X10	1.31
17749	P2510	0.031	—	BMDL
↓	P2513	0.096	X10	.964

Log Lnk	Job #	Analyzed Conc	Dilu	Reported Conc
17749	P2514	"		MATRIX RPT STR

STANDARDS

PREPED ON _____
BY _____
FROM _____ mg/L
STOCK # _____

STANDARD mg/L	VALUE OBTAINED	% of Titration
.300		
.200		
.100		
.050		

SLOPE	Intercept	Corr. Coef

ADDITIONAL COMMENTS

Analyses QA/QC Data Report
SEE CV-12, P 114

QC Batch # PN003

Verified: [signature] 11/29/86

METHOD BLANK		
Spiked Blank (Known)		
Spiked Blank Result		
% Recovery		
EXTERNAL REF. QC		
Known Value		
X̄ Observed Result		
X̄ % Recovery		

PRECISION							
Job # Dup (ETC)							
Original Result							
Duplicate Result							
R̄ Range							
ACCURACY							
Job # Spiked (ETC)							
Original Result							
Amount Spiked							
Spiked S̄ Result							
% Recovery							

To Page No. _____

ETC ENVIRONMENTAL TESTING and CERTIFICATION

CONVENTIONAL CHEMISTRY LAB

ANALYZED ON: 11/29/86

TEST: Phenol, UNITS: mg/L,
METH. REF. # AA/EPA420.2, MDL: .050,
INSTRUMENT # AA Channel #2,

BY: D Herman/RHulit
BOOK # CV-12 P. 113
FROM PAGE # ____

Log Link	Job #	Analyzed Conc.	Dilu	Reported Conc.
17798	P2469	0.030	-	BMDL
↓	P2477	0.014	-	BMDL
	P2524	0.012	-	BMDL
	P2538	0.012	-	BMDL
	P2539	0.012	-	BMDL
↓	P2540	0.014	-	BMDL
17799	P2393	0.038	-	BMDL
↓	P2394	0.028	-	BMDL
17801	P4447	0.004	-	BMDL
17823	P4724	0.002	-	BMDL
17824	P4480	~	-	RPT
17828	P2472	0.028	-	BMDL
↓	P2473	0.017	-	BMDL
	P2522	0.017	-	BMDL
	P2536	0.025	-	BMDL
↓	P2548	0.015	-	BMDL
17837	P4709	0.015	-	BMDL
↓	P4714	0.023	-	BMDL
17864	P2481	0.025	-	BMDL
↓	P2531	0.0106	-	BMDL
	P2541	0.030	-	BMDL
	P2546	0.017	-	BMDL
↓	P2554		=	RPT
178dc	P4850	0.321	-	RPT

Log Link	Job #	Analyzed Conc	Dilu	Reported Conc
178dc	P4851	~	-	RPT
↓	P4852	~	-	RPT
↓	P4853	~	-	RPT
17868	P4510	0.076	-	.076
↓	P4511	0.054	-	.054
↓	P4512	0.056	-	.056
↓	P4513	0.017	-	BMDL
17878	P2776	0.015	-	BMDL
17886	P3120	0.027	-	BMDL
↓	P3122	0.010	-	BMDL
↓	P3124	~	-	OFF SCALE RPT
↓	P3126	0.084	-	.084
17882	P2543	0.036	-	BMDL
↓	P2544	0.060	-	.060
↓	P2545	0.051	-	.051
↓	P2547	0.017	-	BMDL
↓	P2549	0.015	-	BMDL
↓	P2550	0.021	-	BMDL
↓	P2551	0.031	-	BMDL
↓	P2552	0.021	-	BMDL

STANDARDS

PREPED ON ____
BY ____
FROM ____ mg/L
STOCK# ____

STANDARD mg/L	VALUE OBTAINED	% of Theoretical
~~.500~~	PKH	
.300	185.5	~~85.5%~~
.200	63.5	~~63.5%~~
.100	33.5	~~33.5%~~
.050	18.5	~~18.5%~~

SLOPE	Intercept	Corr. Coef.
270.169	6.3474	0.99719

ADDITIONAL COMMENTS

P4480 - matrix interference
P2554 = " " "
P4850 - RPT for dilution
P4851 -
P4852 -
P4853 -
P3124 -
ALL CALCS BY
X = MY + B.

Analyses QA/QC Data Report

QC Batch # PH004

Verified: 11/29/86 RH/Herm

PRECISION

Job # Dup (ETC)	P2469	P4480	P3120	P2551		
Original Result	0.030	MATRIX	0.028	0.036		
Duplicate Result	0.030		0.026	0.026		
R Range		Inter-	0.002	0.010		
ACCURACY						
Job # Spiked (ETC)	P2469	ference	P3120	P2551		
Original Result	0.030	(CH)	0.027	0.031		
Amount Spiked	0.100		.100	.100		
Spiked S' Result	0.123		0.117	0.130		
% Recovery	93.2		90%	99%		

METHOD BLANK	0.019		
Spiked Blank (Known)	.050	.100	
Spiked Blank Result	0.045	0.095	
% Recovery	90%	95%	
EXTERNAL REF. QC	Not Applic		
Known Value			
$\bar{X}$ Observed Result			
$\bar{X}$ % Recovery			

To Page # 05255

ETC ENVIRONMENTAL TESTING and CERTIFICATION

LOG LINK 17866

LABORATORY CHRONICLE: Metals Department

Samples P4850 - P4853

	Chemist	Date
Hg Prep	—	—
AA Prep	—	—
ICAP Prep	[illegible]	11/24/86

Lab Supervisor Joan Komarek Date 11/28/86

SUBCONTRACT
REQUEST FOR ANALYSIS
and SAMPLE CHAIN OF CUSTODY

LOGLINK: 17866

MATRIX: WATER

NAME OF SUBCONTRACT LAB: CHYUN

ETC JOB NUMBERS: P4850 P4853
P4851
P4852

TURNAROUND IN DAYS: NORMAL DATE DATA REQUIRED: 11/22
(If deadline cannot be met, contact ETC Subcontract Group).

Send invoice, bill and reports to : ETC Subcontract Group
(201)225-6786

Please perform the analyses requested below:

____Acidity	____Alkalinity	____Ammonia(probe)
____Ammonia(dist)	____Bicarbonate	____BOD(5 day)
____Bromide	____Carbonate	____Chloride
____Chem.Oxygen Dem.	____Chromium+6	____Fecal Coliform
____Total Coliform	____Color,apparent	____Cyanide,total
____Fluoride	____Formaldehyde(UV)	____Hardness
____Nitrate(NO3)	____Nitrite(NO2)	____TKN
____Odor	____Oil & Grease(grav)	____T.Organic Carb.
____Pet.Hydro(IR)	____Pet.Hydro(grav)	____Phenolics,tot.
____Phenolics(5ug/l)	____Phosphate(ortho)	____Phospate(total)
____Phosphorus(tot.)	____Silica(dissolved)	X Sulfate(SO4)
____Sulfide(S)	____Sulfite(SO3)	____Surfactant(MBAS
____Solids,Total	____Solids,Tot. Diss.	____Solids,Tot.Set.
X Solids,Tot. Sus.	____Solids,Tot. Vol.	____Turbidity
____Gross Alpha,Beta	____Radium 226	____Radium 228

Others: _____

Chain of Custody Section for Courier Pick up at ETC

Sample(s) Relinquished by:(ETC) Jack Ickstadt
Time: 4:30pm Date: 11/5/86
Sample(s) Received by: Mark Kelly
Time: 4:30pm Date: 11/12/86

Chain of Custody Section for Sending Sample from ETC

Sample Shuttle sealed by : _____
Date:____/____/____ Time:_____ Seal Number:_____

Sample Shuttle opened by : _____
Date:____/____/____ Time:_____ Seal Number:_____
Was the Seal intact? _____ Are the shuttle contents in good condition?_____

Chain of Custody Section for Returning Sample to ETC

Sample Shuttle sealed by:_____
Date:____/____/____ Time:_____ Seal Number:_____

Sample Shuttle opened by : _____
Date:____/____/____ Time:_____ Seal Number:_____
Was the Seal intact? _____ Are the shuttle contents in good condition?_____

305257

Technical Report

for

ENVIRONMENTAL STRATEGIES CORP.

WASHINGTON HARBOUR

3050 KK ST. SUITE 325

WASHINGTON, DC 20007

Chain of Custody Data Required for ETC Data Management Summary Reports

ETC Sample No.	Company	Facility	Sample Point	Date	Time	Elapsed Hours
P4853	ENVIRONMENTAL STRATEGIES CORP.	CHAMPION	WCSP-4	861110	1500	

John J. Fitzgerald

Vice President
Research and Operations

This Technical Report is an INSITE℠ service generated by LODESTAR℠ Data Management Software.

TABLE OF CONTENTS

Introduction

This report contains the analytical results on your sample. It is designed to include comprehensive data from the entire analytical process in order to satisfy the needs of various levels of review.

The results obtained from your sample are presented in tabular format immediately following this introduction. Quality assurance data is tabulated along with the appropriate sample results for verification. Depending on the analyses ordered, the quality assurance data may include results from blank, spiked blank, spiked sample (i.e. matrix spike) and replicate sample as well as results from surrogate compound analyses. Quality assurance data for verification of proper instrument performance is also included where appropriate. The report appendices include the chain of custody record for your sample and, where appropriate, the gas chromatograms and mass spectra.

The procedures used in the analysis of the sample are described in this report's methodology section. All analytical procedures within our laboratory are performed within a strictly enforced Quality Assurance Protocol. A description of this Protocol is included in the report.

Results

Sample results, and associated quality assurance data, are always tabulated in one or more of this report's Quantitative Results Tables. The format of each table varies with the class of analysis.

Priority Pollutants

The priority pollutant compounds and elements are listed with their NPDES (National Pollution Discharge Elimination System) numbers, and the Method Detection Limit (MDL) published in the Federal Register. When a compound or element is present below its published MDL it is reported as BMDL (Below Method Detection Limit). When a compound or element is not present at any detectable concentrations it is reported as ND (Not Detected). MDL's for non-aqueous matrices are based on USEPA published MDL's but are adjusted as per sample weight. Matrix spike and replicate analyses, where included, were performed on samples randomly chosen within each quality assurance batch and are therefore not necessarily spikes and replicates of this report's sample. Surrogate compound recovery data and instrument calibration data are included in the Method Performance Data Tables.

ETC ENVIRONMENTAL TESTING and CERTIFICATION

NOV 29, 1986

TABLE 1: QUANTITATIVE RESULTS and QUALITY ASSURANCE DATA

Volatile Compounds – GC/MS Analysis Data (QR01)

Chain of Custody Data Required for ETC Data Management Summary Reports

ETC Sample No.	Company	Facility	Sample Point	Date	Time	Elapsed Hours
P4853	ENVIRONMENTAL STRATEGIES CORP.	CHAMPION	WCSP-4	861110	1500	

NPDES Number	Compound (Acrolein and Acrylonitrile values are screen only)	Results		QC Replicate		QC Blank and Spiked Blank			QC Matrix Spike		
		Sample Concen. ug/l	MDL ug/l	First ug/l	Second ug/l	Blank Data ug/l	Concen. Added ug/l	% Recov	Unspiked Sample ug/l	Concen. Added ug/l	% Recov
1V	Acrolein	ND	100	ND	ND	ND	800	119	ND	800	88
2V	Acrylonitrile	ND	100	ND	ND	ND	80.0	91	ND	80.0	80
3V	Benzene	13.5	4.4	ND	ND	ND	18.0	105	71.1	18.0	98
4V	bis(Chloromethyl)ether	ND	10	ND	ND	ND	0	-	ND	0	-
5V	Bromoform	ND	4.7	ND	ND	ND	18.0	85	ND	18.0	83
6V	Carbon tetrachloride	ND	2.8	ND	ND	ND	18.0	100	ND	18.0	100
7V	Chlorobenzene	ND	6.0	ND	ND	ND	18.0	100	ND	18.0	101
8V	Chlorodibromomethane	ND	3.1	ND	ND	ND	18.0	92	ND	18.0	94
9V	Chloroethane	ND	10	ND	ND	ND	18.0	96	ND	18.0	96
10V	2-Chloroethylvinyl ether	ND	10	ND	ND	ND	18.0	0[a]	ND	18.0	0[a]
11V	Chloroform	ND	1.6	ND	ND	ND	18.0	92	ND	18.0	104
12V	Dichlorobromomethane	ND	2.2	ND	ND	ND	18.0	102	ND	18.0	101
13V	Dichlorodifluoromethane	ND	10	ND	ND	ND	18.0	93	ND	18.0	91
14V	1,1-Dichloroethane	ND	4.7	ND	ND	ND	18.0	95	ND	18.0	101
15V	1,2-Dichloroethane	ND	2.8	ND	ND	ND	18.0	94	ND	18.0	98
16V	1,1-Dichloroethylene	ND	2.8	ND	ND	ND	18.0	96	ND	18.0	97
17V	1,2-Dichloropropane	ND	6.0	ND	ND	ND	18.0	99	ND	18.0	98
18V	cis-1,3-Dichloropropylene	ND	5.0	ND	ND	ND	18.0	94	ND	18.0	95
19V	Ethylbenzene	ND	7.2	ND	ND	ND	18.0	101	ND	18.0	110
20V	Methyl bromide	ND	10	ND	ND	ND	18.0	118	ND	18.0	125
21V	Methyl chloride	ND	10	ND	ND	ND	18.0	104	ND	18.0	92
22V	Methylene chloride	13.9	2.8	ND	ND	7.63	18.0	73	ND	18.0	110
23V	1,1,2,2-Tetrachloroethane	ND	6.9	ND	ND	ND	18.0	113	ND	18.0	115
24V	Tetrachloroethylene	19.7	4.1	ND	ND	ND	18.0	97	ND	18.0	103
25V	Toluene	ND	6.0	ND	ND	ND	18.0	101	24.5	18.0	100
26V	1,2-Trans-dichloroethylene	150	1.6	ND	ND	ND	18.0	93	ND	18.0	95
27V	1,1,1-Trichloroethane	ND	3.8	ND	ND	ND	18.0	106	ND	18.0	102
28V	1,1,2-Trichloroethane	ND	5.0	ND	ND	ND	18.0	98	ND	18.0	95
29V	Trichloroethylene	103	1.9	ND	ND	ND	18.0	93	ND	18.0	85
30V	Trichlorofluoromethane	ND	10	ND	ND	ND	18.0	92	ND	18.0	97
31V	Vinyl chloride	ND	10	ND	ND	ND	18.0	96	ND	18.0	92
18V	trans-1,3-Dichloropropylene	ND	10	ND	ND	ND	18.0	103	ND	18.0	105

[a] Recovery normally variable using established methodology.

3052283

ETC ENVIRONMENTAL TESTING and CERTIFICATION

NOV 29, 1986

TABLE 1: QUANTITATIVE RESULTS and QUALITY ASSURANCE DATA

Acid Compounds - GC/MS Analysis Data (QR02)

Chain of Custody Data Required for ETC Data Management Summary Reports

ETC Sample No.	Company	Facility	Sample Point	Date	Time	Elapsed Hours
P4853	ENVIRONMENTAL STRATEGIES CORP.	CHAMPION	WCSP-4	861110	1500	

NPDES Number	Compound	Results		QC Replicate		QC Blank and Spiked Blank			QC Matrix Spike		
		Sample Concen. ug/l	MDL ug/l	First ug/l	Second ug/l	Blank Data ug/l	Concen. Added ug/l	% Recov	Unspiked Sample ug/l	Concen. Added ug/l	% Recov
1A	2-Chlorophenol	ND	3.5	ND	ND	ND	100	89	ND	102	107
2A	2,4-Dichlorophenol	ND	2.9	ND	ND	ND	100	92	ND	102	100
3A	2,4-Dimethylphenol	ND	2.9	ND	ND	ND	100	18a	ND	102	3a
4A	4,6-Dinitro-o-cresol	ND	26	ND	ND	ND	100	92	ND	102	90
5A	2,4-Dinitrophenol	ND	45	ND	ND	ND	100	77	ND	102	88
6A	2-Nitrophenol	ND	3.9	ND	ND	ND	100	80	ND	102	89
7A	4-Nitrophenol	ND	2.6	ND	ND	ND	100	85	ND	102	97
8A	p-Chloro-m-cresol	ND	3.2	ND	ND	ND	100	77	ND	102	68
9A	Pentachlorophenol	ND	3.9	ND	ND	ND	100	74	ND	102	82
10A	Phenol	ND	1.6	ND	ND	ND	100	89	ND	102	109
11A	2,4,6-Trichlorophenol	ND	2.9	ND	ND	ND	100	89	ND	102	94

a Recovery normally variable using established methodology.

ETC ENVIRONMENTAL TESTING and CERTIFICATION

NOV 30, 1986

TABLE 1: QUANTITATIVE RESULTS and QUALITY ASSURANCE DATA

BASE/NEUTRAL COMPOUNDS - GC/MS ANALYSIS DATA (QR03)

Chain of Custody Data Required for ETC Data Management Summary Reports

ETC Sample No.	Company	Facility	Sample Point	Date	Time	Elapsed Hours
P4853	ENVIRONMENTAL STRATEGIES CORP.	CHAMPION	WCSP-4	861110	1500	

NPDES Number	Compound	Results		QC Replicate		QC Blank and Spiked Blank			QC Matrix Spike		
		Sample Concen. ug/l	MDL ug/l	First ug/l	Second ug/l	Blank Data ug/l	Concen. Added ug/l	% Recov	Unspiked Sample ug/l	Concen. Added ug/l	% Recov
1B	Acenaphthene	ND	2.0	ND	ND	ND	100	87	ND	102	87
2B	Acenaphthylene	ND	3.8	ND	ND	ND	100	90	ND	102	92
3B	Anthracene	ND	2.0	ND	ND	ND	100	84	ND	102	86
4B	Benzidine	ND	47	ND	ND	ND	100	0[a]	ND	102	3[a]
5B	Benzo(a)anthracene	ND	8.4	ND	ND	ND	100	89	ND	102	90
6B	Benzo(a)pyrene	ND	2.7	ND	ND	ND	100	98	ND	102	99
7B	Benzo(b)fluoranthene	ND	11	ND	ND	ND	100	109	ND	102	105
8B	Benzo(ghi)perylene	ND	4.4	ND	ND	ND	0	-	ND	0	-
9B	Benzo(k)fluoranthene	ND	3.8	ND	ND	ND	100	78	ND	102	87
10B	bis(2-Chloroethoxy)methane	ND	5.7	ND	ND	ND	100	80	ND	102	83
11B	bis(2-Chloroethyl) ether	ND	6.1	ND	ND	ND	100	87	ND	102	89
12B	bis(2-Chloroisopropyl)ether	ND	6.1	ND	ND	ND	100	88	ND	102	92
13B	bis(2-Ethylhexyl)phthalate	ND	11	ND	ND	ND	100	92	ND	102	93
14B	4-Bromophenyl phenyl ether	ND	2.0	ND	ND	ND	100	99	ND	102	95
15B	Butyl benzyl phthalate	ND	11	ND	ND	ND	100	75	ND	102	78
16B	2-Chloronaphthalene	ND	2.0	ND	ND	ND	100	87	ND	102	85
17B	4-Chlorophenyl phenyl ether	ND	4.5	ND	ND	ND	100	87	ND	102	91
18B	Chrysene	ND	2.7	ND	ND	ND	100	88	ND	102	88
19B	Dibenzo(a,h)anthracene	ND	11	ND	ND	ND	0	-	ND	0	-
20B	1,2-Dichlorobenzene	ND	2.0	ND	ND	ND	100	76	ND	102	76
21B	1,3-Dichlorobenzene	ND	2.0	ND	ND	ND	100	67	ND	102	72
22B	1,4-Dichlorobenzene	ND	4.7	ND	ND	ND	100	71	ND	102	75
23B	3,3'-Dichlorobenzidine	ND	18	ND	ND	ND	100	52	ND	102	54
24B	Diethyl phthalate	ND	11	ND	ND	ND	100	45	ND	102	48
25B	Dimethyl phthalate	ND	11	ND	ND	ND	100	22[a]	ND	102	18[a]
26B	Di-n-butyl phthalate	ND	11	ND	ND	BMDL	100	63	ND	102	61
27B	2,4-Dinitrotoluene	ND	6.1	ND	ND	ND	100	81	ND	102	110
28B	2,6-Dinitrotoluene	ND	2.0	ND	ND	ND	100	94	ND	102	106
29B	Di-n-octyl phthalate	ND	11	ND	ND	ND	100	101	ND	102	103
30B	1,2-Diphenylhydrazine	ND	11	ND	ND	ND	100	88	ND	102	96
31B	Fluoranthene	ND	2.4	ND	ND	ND	100	70	ND	102	58
32B	Fluorene	ND	2.0	ND	ND	ND	100	88	ND	102	95

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ETC ENVIRONMENTAL TESTING and CERTIFICATION

NOV 30, 1986

TABLE 1: QUANTITATIVE RESULTS and QUALITY ASSURANCE DATA

BASE/NEUTRAL COMPOUNDS - GC/MS ANALYSIS DATA (QR03)

Chain of Custody Data Required for ETC Data Management Summary Reports

ETC Sample No.	Company	Facility	Sample Point	Date	Time	Elapsed Hours
P4853	ENVIRONMENTAL STRATEGIES CORP.	CHAMPION	WCSP-4	861110	1500	

NPDES Number	Compound	Results		QC Replicate		QC Blank and Spiked Blank			QC Matrix Spike		
		Sample Concen. ug/l	MDL ug/l	First ug/l	Second ug/l	Blank Data ug/l	Concen. Added ug/l	% Recov	Unspiked Sample ug/l	Concen. Added ug/l	% Recov
33B	Hexachlorobenzene	ND	2.0	ND	ND	ND	100	93	ND	102	94
34B	Hexachlorobutadiene	ND	.97	ND	ND	ND	100	71	ND	102	75
35B	Hexachlorocyclopentadiene	ND	11	ND	ND	ND	0	-	ND	0	-
36B	Hexachloroethane	ND	1.7	ND	ND	ND	100	62	ND	102	63
37B	Indeno(1,2,3-c,d)pyrene	ND	5.1	ND	ND	ND	0	-	ND	0	-
38B	Isophorone	ND	2.4	ND	ND	ND	100	76	ND	102	80
39B	Naphthalene	ND	1.7	ND	ND	ND	100	80	ND	102	84
40B	Nitrobenzene	ND	2.0	ND	ND	ND	100	89	ND	102	88
41B	N-Nitrosodimethylamine	ND	11	ND	ND	ND	0	-	ND	0	-
42B	N-Nitrosodi-n-propylamine	ND	11	ND	ND	ND	100	65	ND	102	85
43B	N-Nitrosodiphenylamine	ND	2.0	ND	ND	ND	100	83	ND	102	110
44B	Phenanthrene	ND	5.8	ND	ND	ND	100	89	ND	102	89
45B	Pyrene	ND	2.0	ND	ND	ND	100	69	ND	102	55
46B	1,2,4-Trichlorobenzene	ND	2.0	ND	ND	ND	100	158[a]	ND	102	152[a]

[a] Recovery normally variable using established methodology.

ETC ENVIRONMENTAL TESTING and CERTIFICATION

NOV 30, 1986

TABLE 1: QUANTITATIVE RESULTS and QUALITY ASSURANCE DATA

Pesticide/PCB Compounds – GC/MS Analysis Data (QR04)

Chain of Custody Data Required for ETC Data Management Summary Reports

ETC Sample No.	Company	Facility	Sample Point	Date	Time	Elapsed Hours
P4853	ENVIRONMENTAL STRATEGIES CORP.	CHAMPION	WCSP-4	861110	1500	

NPDES Number	Compound	Results		QC Replicate		QC Blank and Spiked Blank			QC Matrix Spike		
		Sample Concen. ug/l	MDL ug/l	First ug/l	Second ug/l	Blank Data ug/l	Concen. Added ug/l	% Recov	Unspiked Sample ug/l	Concen. Added ug/l	% Recov
1P	Aldrin	ND	2.0	ND	ND	ND	100	89	ND	102	55
2P	Alpha-BHC	ND	11	ND	ND	ND	100	39	ND	102	34
3P	Beta-BHC	ND	4.7	ND	ND	ND	100	57	ND	102	67
4P	Gamma-BHC	ND	11	ND	ND	ND	100	34	ND	102	32
5P	Delta-BHC	ND	3.3	ND	ND	ND	100	46	ND	102	44
6P	Chlordane	ND	11	ND	ND	ND	200	69	ND	204	56
7P	4,4'-DDT	ND	3.0	ND	ND	ND	100	72	ND	102	36
8P	4,4'-DDE	ND	6.0	ND	ND	ND	100	84	ND	102	47
9P	4,4'-DDD	ND	5.1	ND	ND	ND	100	71	ND	102	46
10P	Dieldrin	ND	2.7	ND	ND	ND	100	83	ND	102	82
11P	Endosulfan I	ND	11	ND	ND	ND	100	29	ND	102	11a
12P	Endosulfan II	ND	11	ND	ND	ND	100	30	ND	102	8a
13P	Endosulfan sulfate	ND	6.0	ND	ND	ND	100	44	ND	102	44
14P	Endrin	ND	11	ND	ND	ND	100	74	ND	102	72
15P	Endrin aldehyde	ND	11	ND	ND	ND	100	29	ND	102	30
16P	Heptachlor	ND	2.0	ND	ND	ND	100	97	ND	102	68
17P	Heptachlor epoxide	ND	2.4	ND	ND	ND	100	86	ND	102	106
18P	PCB-1242	ND	39	ND	ND	ND	0	-	ND	0	-
19P	PCB-1254	ND	39	ND	ND	ND	0	-	ND	0	-
20P	PCB-1221	ND	39	ND	ND	ND	0	-	ND	0	-
21P	PCB-1232	ND	39	ND	ND	ND	0	-	ND	0	-
22P	PCB-1248	ND	39	ND	ND	ND	0	-	ND	0	-
23P	PCB-1260	ND	39	ND	ND	ND	100	93	ND	102	49
24P	PCB-1016	ND	39	ND	ND	ND	0	-	ND	0	-
25P	Toxaphene	ND	11	ND	ND	ND	0	-	ND	0	-

a Recovery normally variable using established methodology.

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ETC ENVIRONMENTAL TESTING and CERTIFICATION

NOV 29, 1986

TABLE 1: QUANTITATIVE RESULTS

Metals - Analysis Data (QR52)

Chain of Custody Data Required for ETC Data Management Summary Reports

ETC Sample No.	Company	Facility	Sample Point	Date	Time	Elapsed Hours
P4853	ENVIRONMENTAL STRATEGIES CORP.	CHAMPION	WCSP-4	861110	1500	

Compound	Results								
	Sample Concen, ug/l	MDL ug/l							
Barium	66	3.2							
Chromium	BMDL	26							
Copper	BMDL	13							
Iron	145000	180							
Manganese	7360	3.7							
Nickel	11	11							
Sodium	1480000	87							
Zinc	150	2.9							

ETC ENVIRONMENTAL TESTING and CERTIFICATION

DEC 19, 1986

TABLE 1: QUANTITATIVE RESULTS and QUALITY ASSURANCE DATA

Conventional Analysis Data (QR10)

Chain of Custody Data Required for ETC Data Management Summary Reports

ETC Sample No.	Company	Facility	Sample Point	Date	Time	Elapsed Hours
P4853	ENVIRONMENTAL STRATEGIES CORP.	CHAMPION	WCSP-4	861110	1500	

NPDES Number	Results									
	Sample Concen. mg/l	MDL mg/l								
Fluoride	.98	.10								
Nitrate as N	4.42	.10								
Sulfate as SO4	270	2								
Phenolics, Total	<.050	.050								
Cyanide, Total	1.23	.025								
Solids, total suspended	14000	2								

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December 1, 1986

TABLE 2: METHOD PERFORMANCE DATA

Surrogate Recovery – Aqueous Matrices (QR20)

Chain of Custody Data Required for ETC Data Management Summary Reports

P4853

ETC Sample No.	Company	Facility	Sample Point	Date	Time	Elapsed Hours

Compound	Amount Added ug	% Recovery	Control Limits *	
			Lower	Upper
VOLATILE FRACTION (GC/MS)				
Toluene-D8	.250	98	88	110
Bromofluorobenzene	.250	96	86	115
1,2-Dichloroethane-D4	.250	97	76	114
ACID FRACTION (GC/MS)				
Phenol-D5	100	87	10	94
2-Fluorophenol	100	87	21	100
2,4,6-Tribromophenol	100	72	10	123
BASE/NEUTRAL FRACTION (GC/MS)				
Nitrobenzene-D5	50	88	35	114
2-Fluorobiphenyl	50	59	43	116
Terphenyl-D14	50	12***	33	141
PESTICIDE/PCB FRACTION (GC/MS)				
Dibutylchlorendate	-	-	24**	154**

* IFB EPA Control Limits.
** Advisory Limits Only.
*** Recovery manually verified.

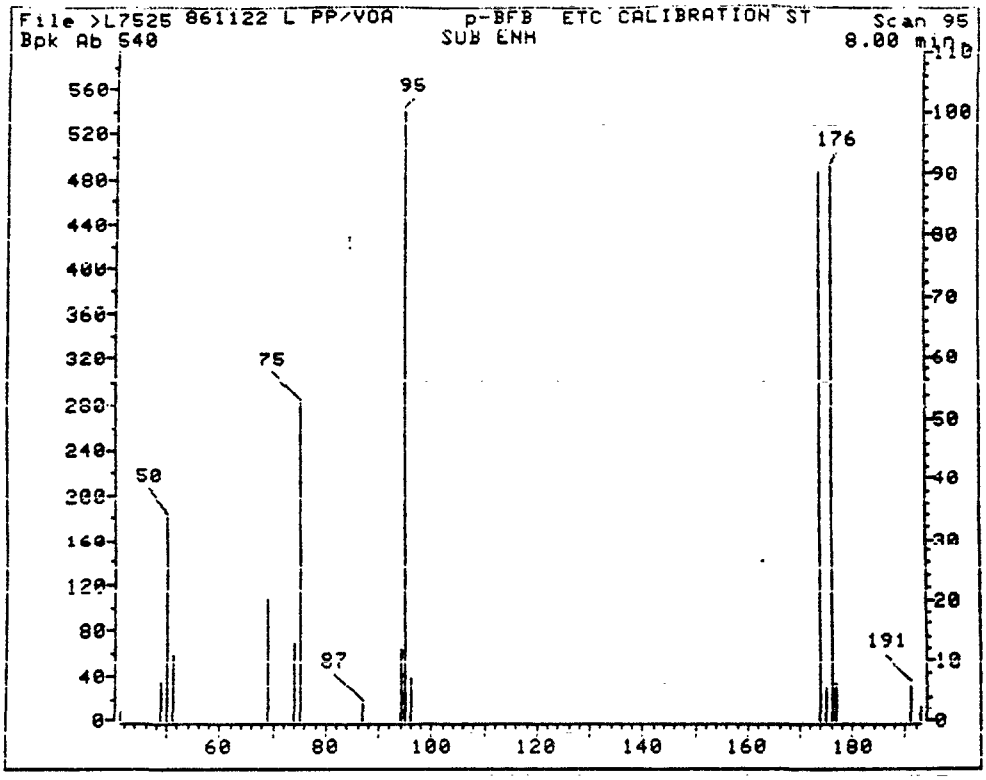

TABLE 2: METHOD PERFORMANCE DATA (QR21)

GC/MS Tuning Data - Bromofluorobenzene (BFB) for Volatiles Analysis

m/z	Ion Abundance Criteria	% Relative Abundance Base Peak	% Relative Abundance Appropriate Peak	Status
50	15-40% of mass 95	33.35	33.35	Ok
75	30-60% of mass 95	52.25	52.25	Ok
95	Base peak, 100% relative abundance	100.00	100.00	Ok
96	5-9% of mass 95	7.13	7.13	Ok
173	Less than 1% of mass 95	0.00	0.00	Ok
174	Greater than 50% of mass 95	90.46	90.46	Ok
175	5-9% of mass 174	5.56	6.14	Ok
176	95-101% of mass 174	91.20	100.82	Ok
177	5-9% of mass 176	6.16	6.75	Ok

Injection Date: 11/22/86
Injection Time: 21:11
Run No: >L7525
Spectrun No: 95

Analyst: [signature]
Processor: [illegible]
QC Batch: QV5536
Samples: ~~P5298, P5486, P5489, P5493, P5497~~ P4511, P4612, P4853, P2774, P2775, P27[illegible] P3325, P3326, P3327, P3328, P3330 P3331, P3332, P3333, P1957

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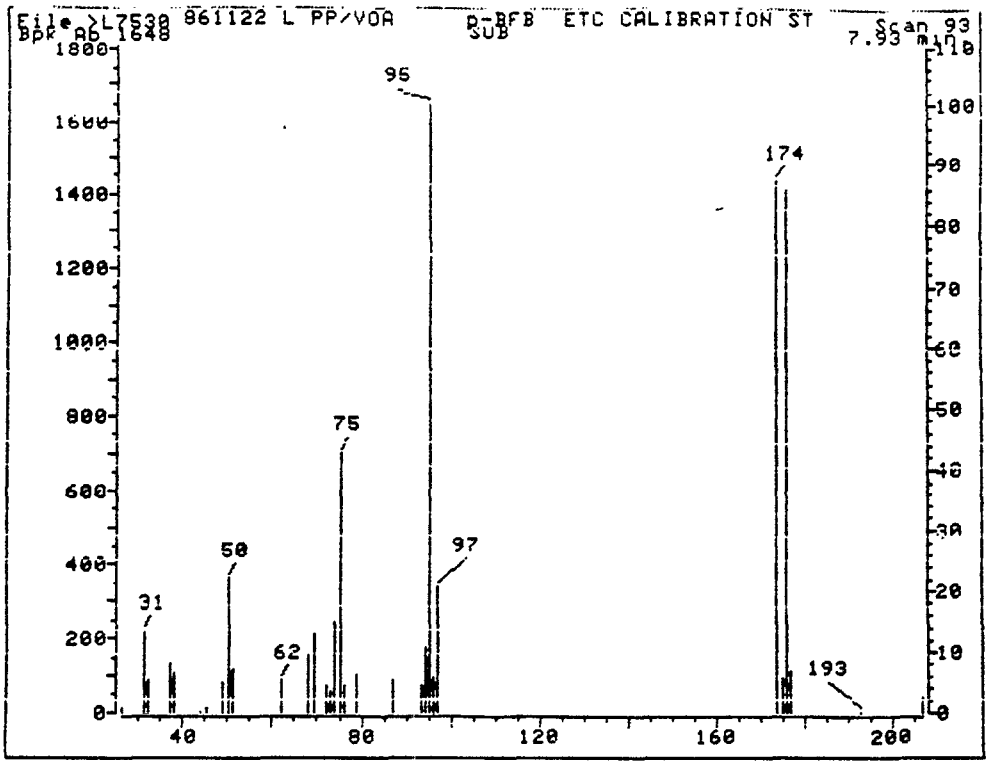

TABLE 2: METHOD PERFORMANCE DATA (QR21)

GC/MS Tuning Data - Bromofluorobenzene (BFB) for Volatiles Analysis

m/z	Ion Abundance Criteria	% Relative Abundance Base Peak	% Relative Abundance Appropriate Peak	Status
50	15-40% of mass 95	22.03	22.03	Ok
75	30-60% of mass 95	42.60	42.60	Ok
95	Base peak, 100% relative abundance	100.00	100.00	Ok
96	5-9% of mass 95	6.01	6.01	Ok
173	Less than 1% of mass 95	0.00	0.00	Ok
174	Greater than 50% of mass 95	87.32	87.32	Ok
175	5-9% of mass 174	5.58	6.39	Ok
176	95-101% of mass 174	85.92	98.40	Ok
177	5-9% of mass 176	6.80	7.91	Ok

Injection Date: 11/23/86 Analyst: [signature]
Injection Time: 00:42 Processor: [illegible]
Run No: >L7530 WC Batch: QV5336
Spectrun No: 93 Samples: ~~P3338~~ ~~P3346~~, ~~P3349~~, P3493, ~~P3467~~
P4511, P4512, P4863, P2774, P2775,
P2762, P3325, P3326, P3327, P3328
P3330, P3331, P3332, P3333, P1957

11/24/86

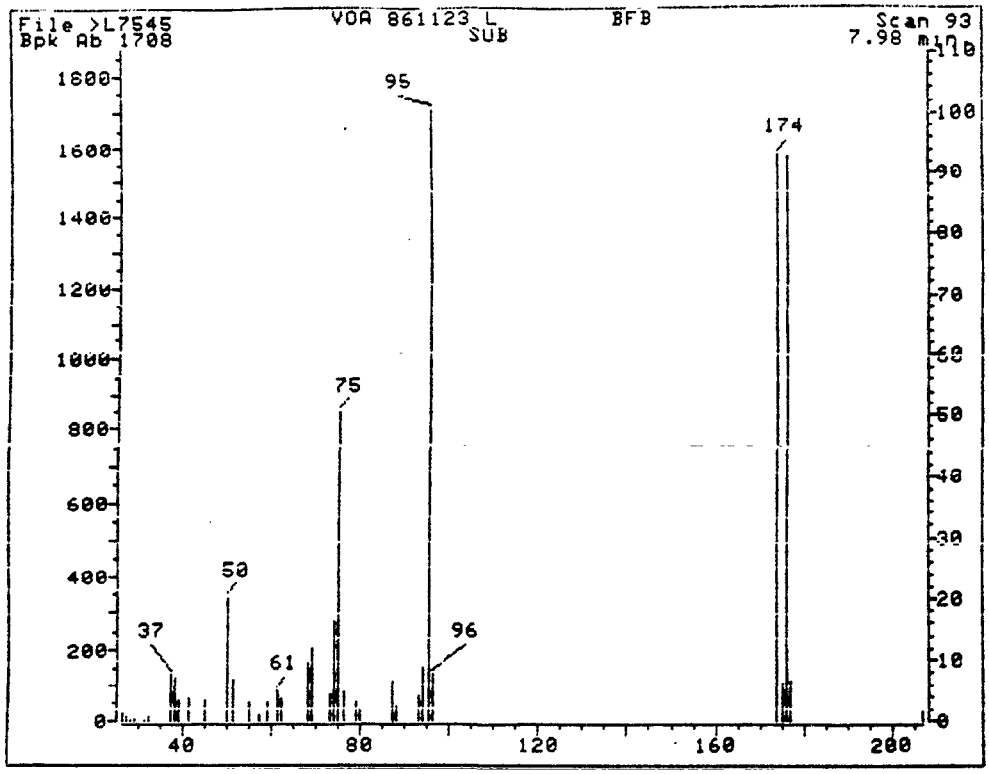

TABLE 2: METHOD PERFORMANCE DATA (QR21)

GC/MS Tuning Data - Bromofluorobenzene (BFB) for Volatiles Analysis

m/z	Ion Abundance Criteria	% Relative Abundance Base Peak	% Relative Abundance Appropriate Peak	Status
50	15-40% of mass 95	20.02	20.02	Ok
75	30-60% of mass 95	49.82	49.82	Ok
95	Base peak, 100% relative abundance	100.00	100.00	Ok
96	5-9% of mass 95	7.67	7.67	Ok
173	Less than 1% of mass 95	0.00	0.00	Ok
174	Greater than 50% of mass 95	92.51	92.51	Ok
175	5-9% of mass 174	6.32	6.84	Ok
176	95-101% of mass 174	92.21	99.68	Ok
177	5-9% of mass 176	6.38	6.92	Ok

Injection Date: 11/23/86
Injection Time: 13:45
Run No: >L7545
Spectrun No: 93

Analyst: [signature]
Processor: [illegible]
QC Batch: QV 5936
Samples: ~~[illegible]~~, P4511, P4512, P4863, P2774, P2775, P3325, P3326, P3327, P3328, P3330, P3332, P3333, P1957

KS 11/29/86

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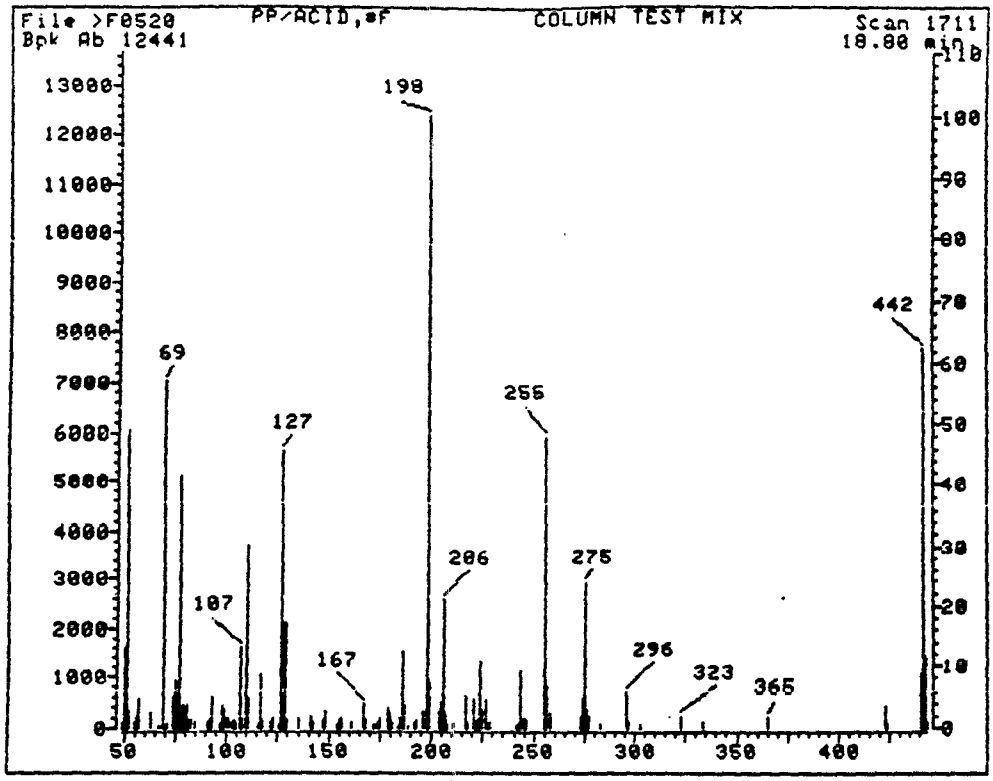

TABLE 2: METHOD PERFORMANCE DATA (QR22)

GC/MS Tuning Data - Decafluorotriphenylphospine (DFTPP) for Acids Analysis

m/z	Ion Abundance Criteria	% Relative Abundance Base Peak	% Relative Abundance Appropriate Peak	Status
51	30-60% of mass 198	48.52	48.52	Ok
68	Less than 2% of mass 69	0.00	0.00	Ok
69	(reference only)	56.51	56.51	Ok
70	Less than 2% of mass 69	.42	.74	Ok
127	40-60% of mass 198	45.35	45.35	Ok
197	Less than 1% of mass 198	0.00	0.00	Ok
198	Base peak, 100% relative abundance	100.00	100.00	Ok
199	5-9% of mass 198	7.19	7.19	Ok
275	10-30% of mass 198	23.50	23.50	Ok
365	Greater than 1% of mass 198	1.89	1.89	Ok
441	0-100% of mass 443	8.79	76.34	Ok
442	Greater than 40% of mass 198	62.49	62.49	Ok
443	17-23% of mass 442	11.52	18.43	Ok

Injection Date: 11/26/86 Analyst: [signature]
Injection Time: 07:29 Processor: [signature]
Run No: >F0520 QC Batch: QA6013
Spectrum No: 1711 Samples: G0447-G0450, G0457, G0458, G0467, G0468, G0471, G0472, G0489, G0493-G0495, G4852, G4853, G0472

11/26/86

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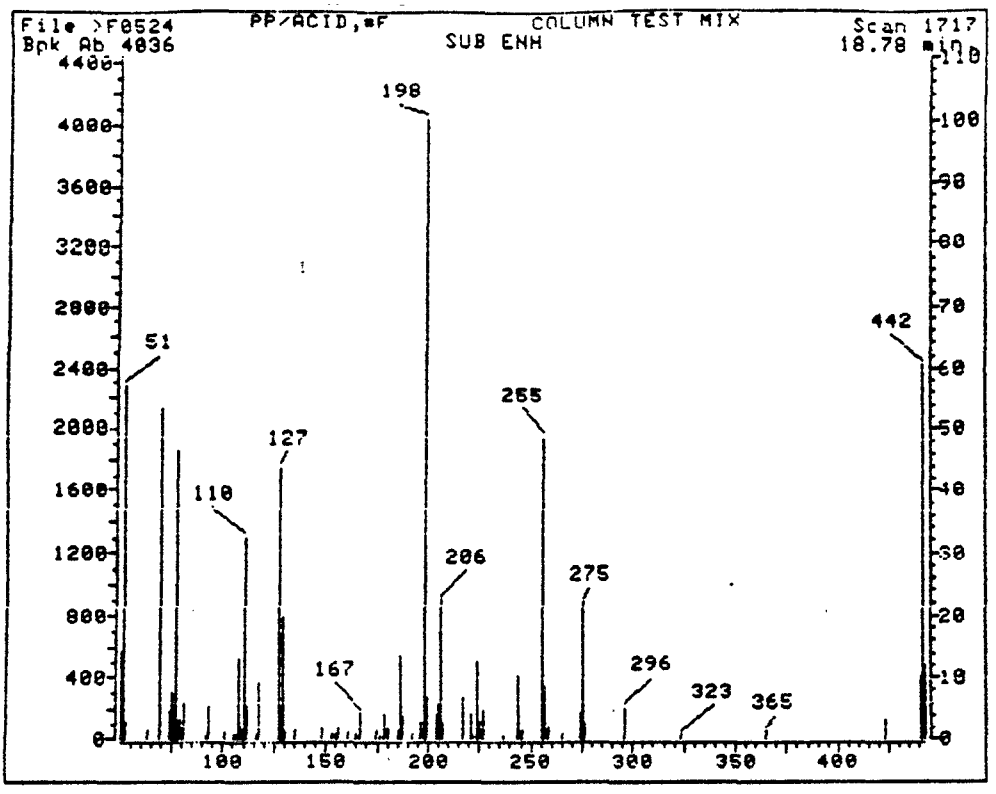

TABLE 2: METHOD PERFORMANCE DATA (QR22)

GC/MS Tuning Data - Decafluorotriphenylphospine (DFTPP) for Acids Analysis

m/z	Ion Abundance Criteria	% Relative Abundance Base Peak	% Relative Abundance Appropriate Peak	Status
51	30-60% of mass 198	56.57	56.57	Ok
68	Less than 2% of mass 69	0.00	0.00	Ok
69	(reference only)	52.49	52.49	Ok
70	Less than 2% of mass 69	0.00	0.00	Ok
127	40-60% of mass 198	43.39	43.39	Ok
197	Less than 1% of mass 198	0.00	0.00	Ok
198	Base peak, 100% relative abundance	100.00	100.00	Ok
199	5-9% of mass 198	6.54	6.54	Ok
275	10-30% of mass 198	21.76	21.76	Ok
365	Greater than 1% of mass 198	1.26	1.26	Ok
441	0-100% of mass 443	10.00	84.54	Ok
442	Greater than 40% of mass 198	60.51	60.51	Ok
443	17-23% of mass 442	11.83	19.55	Ok

Injection Date: 11/26/86 Analyst: [signature]
Injection Time: 11:04 Processor: [signature]
Run No: >F0524 QC Batch: QA6013
Spectrun No: 1717 Samples: 80447-80450, 80452, 80453, 80457, 80458, 80467, 80468, 80471, 80472.

11/29/86

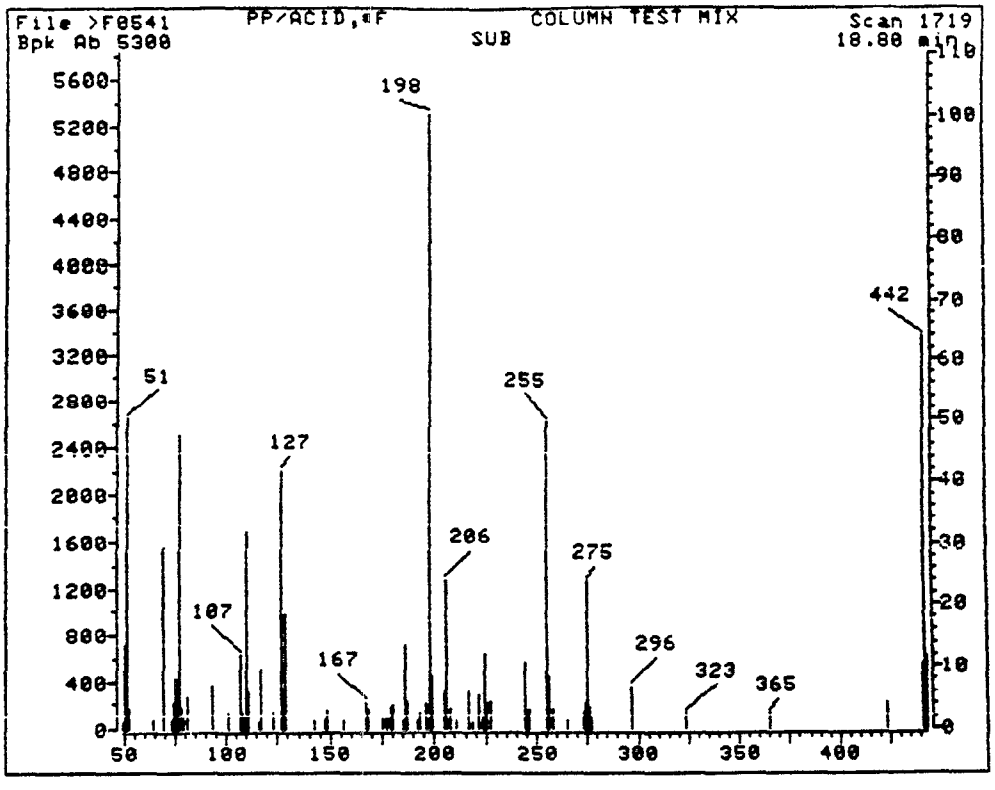

TABLE 2: METHOD PERFORMANCE DATA (QR22)

GC/MS Tuning Data - Decafluorotriphenylphospine (DFTPP) for Acids Analysis

m/z	Ion Abundance Criteria	% Relative Abundance Base Peak	% Relative Abundance Appropriate Peak	Status
51	30-60% of mass 198	49.92	49.92	Ok
68	Less than 2% of mass 69	0.00	0.00	Ok
69	(reference only)	29.34	29.34	Ok
70	Less than 2% of mass 69	0.00	0.00	Ok
127	40-60% of mass 198	41.43	41.43	Ok
197	Less than 1% of mass 198	0.00	0.00	Ok
198	Base peak, 100% relative abundance	100.00	100.00	Ok
199	5-9% of mass 198	8.38	8.38	Ok
275	10-30% of mass 198	23.66	23.66	Ok
365	Greater than 1% of mass 198	2.28	2.28	Ok
441	0-100% of mass 443	10.34	88.96	Ok
442	Greater than 40% of mass 198	63.66	63.66	Ok
443	17-23% of mass 442	11.62	18.26	Ok

Injection Date: 11/26/86 Analyst:
Injection Time: 22:39 Processor:
Run No: >F0541 QC Batch: QA0013
Spectrun No: 1719 Samples: 80494, 80493, 80494, 81495

11/29/86

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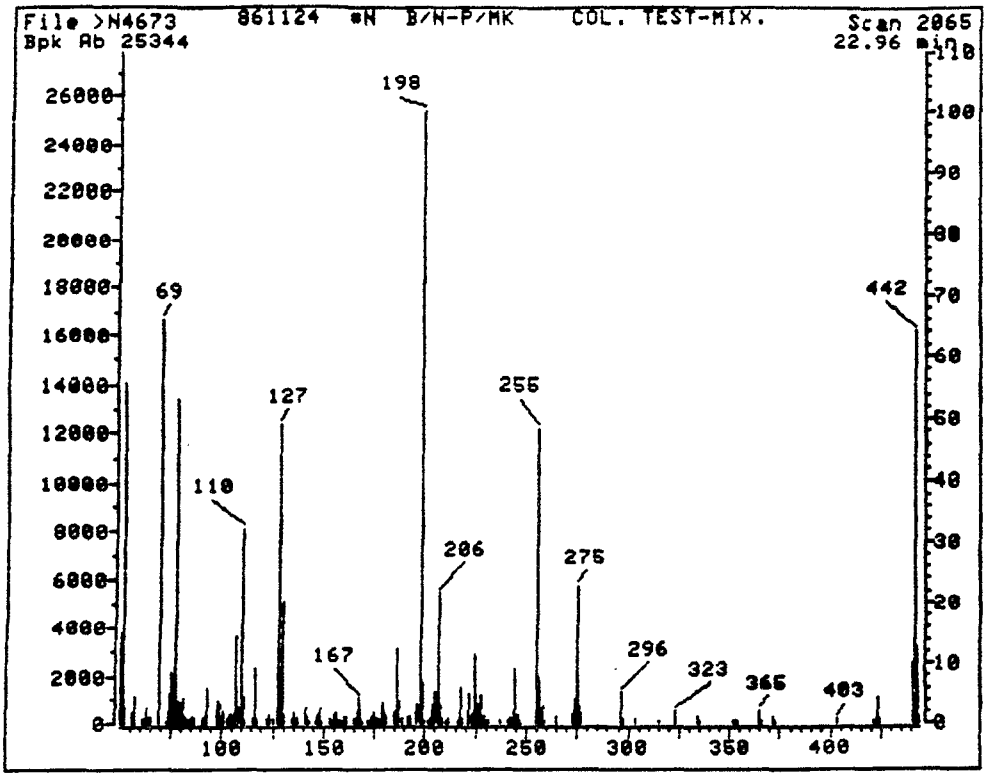

TABLE 2: METHOD PERFORMANCE DATA (QR23)

GC/MS Tuning Data - Decafluorotriphenylphospine (DFTPP) for Base/Neutral Analysis

m/z	Ion Abundance Criteria	% Relative Abundance Base Peak	% Relative Abundance Appropriate Peak	Status
51	30-60% of mass 198	55.50	55.50	Ok
68	Less than 2% of mass 69	0.00	0.00	Ok
69	(reference only)	65.88	65.88	Ok
70	Less than 2% of mass 69	0.00	0.00	Ok
127	40-60% of mass 198	48.83	48.83	Ok
197	Less than 1% of mass 198	0.00	0.00	Ok
198	Base peak, 100% relative abundance	100.00	100.00	Ok
199	5-9% of mass 198	6.67	6.67	Ok
275	10-30% of mass 198	22.60	22.60	Ok
365	Greater than 1% of mass 198	2.14	2.14	Ok
441	0-100% of mass 443	9.87	78.53	Ok
442	Greater than 40% of mass 198	64.00	64.00	Ok
443	17-23% of mass 442	12.57	19.64	Ok

Injection Date: 11/25/86 Analyst: J. Kendall
Injection Time: 14:37 Processor: D.A.C.C.
Run No: >N4673 QC Batch: BB6013
Spectrun No: 2065 Samples: P0447-P0450, P0457, P0458, P0459, P0460, P0461, P0462, P0463, P0464-P0467, P0852, P0853

LAH 11-30

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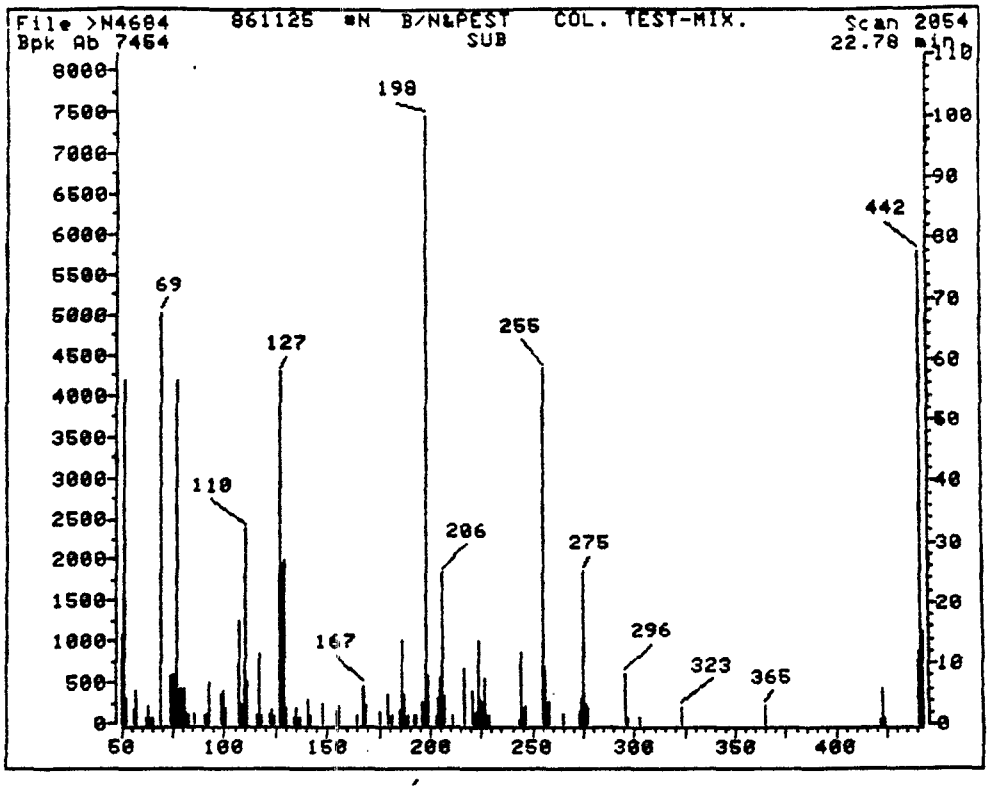

TABLE 2: METHOD PERFORMANCE DATA (QR23)

GC/MS Tuning Data - Decafluorotriphenylphospine (DFTPP) for Base/Neutral Analysis

m/z	Ion Abundance Criteria	% Relative Abundance Base Peak	% Relative Abundance Appropriate Peak	Status
51	30-60% of mass 198	56.12	56.12	Ok
68	Less than 2% of mass 69	0.00	0.00	Ok
69	(reference only)	67.41	67.41	Ok
70	Less than 2% of mass 69	0.00	0.00	Ok
127	40-60% of mass 198	57.59	57.59	Ok
197	Less than 1% of mass 198	0.00	0.00	Ok
198	Base peak, 100% relative abundance	100.00	100.00	Ok
199	5-9% of mass 198	7.90	7.90	Ok
275	10-30% of mass 198	25.03	25.03	Ok
365	Greater than 1% of mass 198	3.03	3.03	Ok
441	0-100% of mass 443	12.03	79.24	Ok
442	Greater than 40% of mass 198	77.68	77.68	Ok
443	17-23% of mass 442	15.19	19.55	Ok

Injection Date: 11/26/86 Analyst: [signature]
Injection Time: 03:17 Processor: D.A.C.
Run No: >N4684 QC Batch: QB6013
Spectrun No: 2054 Samples: P0447-~~50~~, P0450, P0451, P0~~45~~, P0467, P0468, P0471, P0472, P~~0~~, P0493-P0495, P4852, P4853

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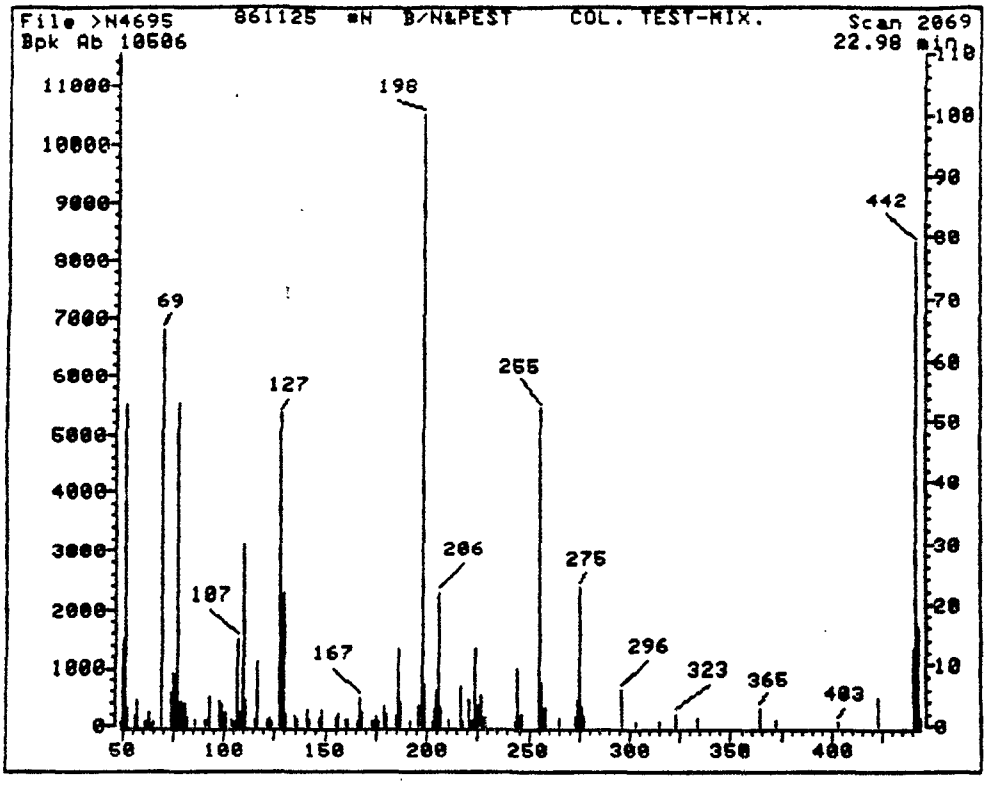


TABLE 2: METHOD PERFORMANCE DATA (QR23)

GC/MS Tuning Data - Decafluorotriphenylphospine (DFTPP) for Base/Neutral Analysis

m/z	Ion Abundance Criteria	% Relative Abundance Base Peak	% Relative Abundance Appropriate Peak	Status
51	30-60% of mass 198	52.28	52.28	Ok
68	Less than 2% of mass 69	0.00	0.00	Ok
69	(reference only)	64.83	64.83	Ok
70	Less than 2% of mass 69	0.00	0.00	Ok
127	40-60% of mass 198	50.89	50.89	Ok
197	Less than 1% of mass 198	0.00	0.00	Ok
198	Base peak, 100% relative abundance	100.00	100.00	Ok
199	5-9% of mass 198	6.94	6.94	Ok
275	10-30% of mass 198	22.61	22.61	Ok
365	Greater than 1% of mass 198	3.04	3.04	Ok
441	0-100% of mass 443	12.55	77.32	Ok
442	Greater than 40% of mass 198	79.16	79.16	Ok
443	17-23% of mass 442	16.24	20.51	Ok

Injection Date: 11/26/86 Analyst: V. Vincent
Injection Time: 12:15 Processor: W.D.C.
Run No: >N4695 QC Batch: QB6013
Spectrun No: 2069 Samples: P0447-P0450, P0457, P0458 P0467, P0468.

MH 11-30

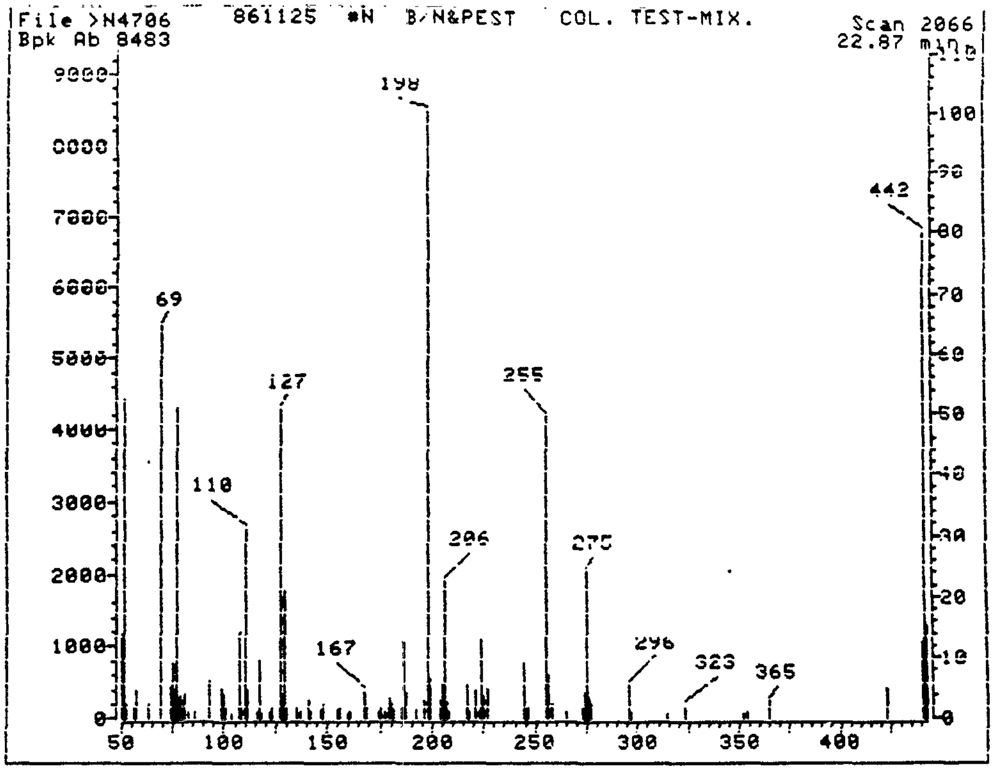


TABLE 2: METHOD PERFORMANCE DATA (QR23)

GC/MS Tuning Data - Decafluorotriphenylphospine (DFTPP) for Base/Neutral Analysis

m/z	Ion Abundance Criteria	% Relative Abundance Base Peak	% Relative Abundance Appropriate Peak	Status
51	30-60% of mass 198	52.22	52.22	Ok
68	Less than 2% of mass 69	0.00	0.00	Ok
69	(reference only)	64.29	64.29	Ok
70	Less than 2% of mass 69	0.00	0.00	Ok
127	40-60% of mass 198	50.49	50.49	Ok
197	Less than 1% of mass 198	0.00	0.00	Ok
198	Base peak, 100% relative abundance	100.00	100.00	Ok
199	5-9% of mass 198	6.64	6.64	Ok
275	10-30% of mass 198	24.07	24.07	Ok
365	Greater than 1% of mass 198	2.91	2.91	Ok
441	0-100% of mass 443	12.58	82.33	Ok
442	Greater than 40% of mass 198	79.88	79.88	Ok
443	17-23% of mass 442	15.28	19.13	Ok

Injection Date: 11/26/86 Analyst: [illegible]
Injection Time: 21:29 Processor: [illegible]
Run No: >N4706 QC Batch: QB6013
Spectrum No: 2066 Samples: P0471, P0472, P0489, P0493, P0494, P0495, ~~P0496~~ P0852, P0853

305280

[illegible] 11-30

Methodology
for
GC/MS Analysis of Priority Pollutant Compounds

The methods employed in the GC/MS analysis for priority pollutants are established EPA methods. Rigid compliance with the instrument parameters and performance criteria of the published methods was achieved. In some cases, the precise amounts of sample used and the sample handling procedures vary with the complexity of the sample matrix. Qualitative identification of the priority pollutants was performed using the relative retention times, the relative abundance of three characteristic ions and the abundance ratios. The entire mass spectrum was reviewed to confirm each identification. Quantitative analysis of detected compounds was performed by using a response factor generated by a major characteristic ion of the specific compound and an internal standard.

Compounds, in addition to those on the priority pollutant list, were identified through a computer-aided search of the NBS-EPA spectra library. After review the identifications are included in a separate tabulation and labelled "tentatively identified".

Volatile Priority Pollutant Compounds

For the analysis of Volatile priority pollutants, EPA Method 624 was used. The method can be summarized as follows: Helium is bubbled through a 5 ml water sample contained in a specially designed purging chamber at ambient temperature. The purgeable volatile organic compounds are transferred from the aqueous phase to the vapor phase. The vapor is swept through a sorbent column where the organic components are trapped. After the purge cycle is complete, the sorbent column is heated and backflushed with helium to desorb the organic purgeables onto a gas chromatographic column. The gas chromatograph is temperature programmed to separate the purgeable mixture. The separated purgeable components are then identified and quantitated using a computerized mass spectrometer.

Acid, Base/Neutral and Pesticide Priority Pollutant Compounds

For the analysis of the Acid, Base/Neutral and Pesticide priority pollutants in an aqueous liquid matrix, EPA Method 625 was used. The method can be summarized as follows: A measured volume of sample, approximately 1 liter, is adjusted to a pH greater than 11 and extracted with methylene chloride. The pH of the sample is adjusted to a value less than 2 and extracted with an aliquot of fresh methylene chloride. A separatory funnel or continuous extractor is used to perform the extractions. The two extracts are dried and concentrated to a 1 ml final volume. Each extract is injected into a GC/MS instrument specifically configured for the correct fraction.

Methodology for Analysis of Metals

AQUEOUS

The determination of metals in aqueous samples is performed according to the methods published by EPA in "Methods for Chemical Analysis of Water and Wastes," EPA-600/4-79-020, March, 1983, and the Federal Register, October 26, 1983. Arsenic, selenium and thallium are determined by furnace AA; silver, aluminum, barium, beryllium, boron, cadmium, calcium, chromium, copper, cobalt, iron, magnesium, manganese, molybdenum, nickel, lead, sodium, antimony, tin, titanium, vanadium, and zinc are determined by ICP emission spectrometry, except where lower levels of detection are required: in these cases (e.g. lead in groundwater monitoring samples) furnace AA is used. All furnace AA parameters are run by method of standard additions. The determination of mercury is performed by cold vapor AA.

EP TOXICITY

The determination of metals in aqueous EP Toxicity leachates is performed according to the methods published by EPA in "Test Methods for Evaluating Solid Waste" EPA SW-846, revised April, 1984 and the Federal Register, Oct. 26, 1983. 1979. Silver, arsenic, barium, cadmium, chromium, lead and selenium are determined by ICP emission spectrometry. Mercury is determined using cold vapor AA. For leachates that are organic in nature, the analyses are performed according to the methods described under ***OIL/SLUDGE*** below.

SOIL/SEDIMENT

The determination of silver, beryllium, cadmium, chromium, copper, nickel, antimony, lead, and zinc in sediment samples is performed according to methods published by EPA in "Interim Methods for the Sampling and Analysis of Priority Pollutants in Sediments and Fish Tissue", EPA 600/4-81-055, October 1980. Mercury is determined according to the sediment method published by EPA in "Method for Chemical Analysis of Water and Wastes", EPA 600/4-79-020, March 1983. Arsenic, selenium and thallium are determined by furnace AA using nitric acid in a closed decomposition vessel for sample digestion.

OIL/SLUDGE

The determination of silver, aluminum, boron, barium, beryllium, calcium, cadmium, copper, chromium, cobalt, iron, magnesium, manganese, molybdenum, sodium, nickel, lead, antimony, tin, titanium, vanadium, and zinc in sludge/petroleum-based samples is performed by ICP emission spectrometry using a magnesium nitrate dry ashing digestion technique. Arsenic, selenium and thallium are determined by furnace AA using nitric acid in a closed decomposition vessel for sample digestion. Mercury is determined by cold vapor AA using the same digestion technique.

ETC ENVIRONMENTAL TESTING and CERTIFICATION

Summary of Quality Assurance/Quality Control Procedures (QA/QC)

ETC bases its quality assurance protocols on the following government guidelines:

- "Handbook for Analytical Quality Control in Water and Wastewater Laboratories", EPA-600/4-79-019, March 1979;
- National Enforcement Investigation Center Policies, and Procedures manual; EPA-330/9/79/001-R, October 1979;
- the recommended guidelines for EPA Methods 624 and 625. (Federal Register, December 3, 1979, updated on October 26, 1984);
- "Manual of Analytical Methods for the Analysis of Pesticides in Humans and Environmental Samples," EPA 600/8-80-038, June 1980;
- "Determination of 2,3,7,8-TCDD in Soil and Sediment" EPA, Region VII, Kansas City, September 1983;
- Organic Analysis: Multi-media, Multi Concentration-IFB WA84-A267; and
- Dioxin Analysis:Soil/Sediment Matrix; Multi-Concentration; Selected Ion Monitoring with Jar Extration Procedure-IFB WA84-A002

However, we have modified our protocols to provide a higher level of QA/QC than the guidelines require. For example, we analyze a higher than required number of quality control samples and we pay especially careful attention to the certification of the "reference standard" compounds we use in analysis. Below are listed the key QA/QC elements for the methods we used.

Analysis of Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry

- Each batch of 13 samples consists of 9 customer samples (at a maximum), one blank sample, one spiked blank, one spiked sample and one replicate sample. This amounts to a 30% quality control factor.
- Three surrogate compounds are added to each sample in the batch of 13.
- A blind quality control sample is introduced to the laboratory for analysis on a weekly basis.
- Each GC/MS is checked and retuned, if necessary, at the beginning of each day to ensure that its performance on bromofluorobenzene (BFB) meets the EPA criteria.
- A calibration curve for quantitation is prepared using a mixture of Volatile Organic Priority Pollutant "standards" at a minimum of 3 different concentrations and using a mixture of 3 internal standards at a constant concentration.
- The calibration curve is verified with a mixture of priority pollutant standards every day. If the response factors vary greater than 25%, the instrument must be recalibrated.

Analysis of Organic Compounds Extracted in Acid or Base/Neutral Solutions by Gas Chromatography/Mass Spectrometry

- Each batch of 20 samples consists of 16 customer samples (at a maximum), one blank sample, one spiked blank (for water matrices), one sample spiked with the priority pollutant standard mixture and a duplicate customer sample. This amounts to a 20% quality control factor.

- Three surrogate compounds are added to each sample in the batch for Base/Neutral analysis.
- Three surrogate compounds are added to each sample in the batch for Acid analysis
- A blind quality control sample is introduced to the laboratory for analysis on a weekly basis.
- Each GC/MS is checked and retuned, if necessary, at the beginning of each day to ensure that its performance on decafluorotriphenylphosphine (DFTPP) meets the EPA criteria.
- A calibration curve for quantitation is prepared using a mixture of standards composed of either the Organic Acid or Base/Neutral Extractable Compounds at a minimum of 3 concentrations and using five internal standards for quantitation.

Analysis of Metals

All Samples

- New standards are prepared for each batch of samples
- Normal calibration is performed using a blank sample and four standards that have been through the sample preparation procedure. A regression analysis is used to construct the calibration curve.
- All EP Toxicity samples and all samples determined by furnace atomic absorption are calculated by the "method of additions".
- For each sample analysis that requires the use of the "method of additions" technique, a three point calibration is performed using U.S. EPA "Methods for Chemical Analysis of Water and Wastes, 1979". Results are obtained using linear regression analysis. Any regression with a coefficient of correlation below 0.990 is considered suspect, necessitating review of calibration data or sample re-analysis.
- In constructing the normal calibration curves the lowest concentration levels we use are values greater than or equal to 5 times the Instrumental Detection Limit (IDL).
- All calibration standards are analyzed in duplicate, at a minimum.
- Independent reference standards are used to check the accuracy of calibration standards.
- A check standard is analyzed every ten samples to validate the normal calibration curve.
- One customer sample out of every ten is analyzed in triplicate.

Homogeneous Samples (except for Mercury analysis)

Samples are analyzed in batches of 30 or less. For batches in which the sample matrices are homogeneous, the QC program is a minimum of 25% and consists of analyzing:

- 3 sets of triplicate analyses,
- 2 Replicate spikes;
- 1 independent reference standard;
- 4 Calibration standards (processed using the sample preparation method);
- 4 Calibration standards (without sample preparation); and
- 1 Reagent Blank

Heterogeneous Samples (except for Mercury analysis)

Samples are analyzed in batches of 30 or less. For batches in which the sample matrices are heterogeneous, the QC program is a minimum of 35% and consists of analyzing:

- 3 sets of triplicate analyses;
- 2 Replicate spikes;
- 1 Replicate independent reference standards;
- 4 Calibration standards (processed using the sample preparation method);
- 1 Procedural Blank;
- 4 Calibration standards (without sample preparation); and
- 1 Reagent Blank.

Analysis of Mercury

To analyze samples for mercury we group them by matrix in batches of 30 or less. Our QC program is a minimum of 30% and consists of analyzing:

- each of the 30 customer samples in duplicate;
- 3 sets of triplicate anaylses;
- 2 Replicate spikes,
- 2 Replicate indepencent reference standards;
- 10 Calibration standards (processed using the sample preparation method); and
- 2 Procedural Blanks

Analysis of Pesticides, Herbicides and PCB's by Gas Chromatography

Pesticide, herbicide and PCB samples are grouped in batches of 16 customer samples or less according to the type of analysis to be performed. The QC program for each of these three types of analyses is a minimum of 20% and consists of analyzing:

- 1 procedural blank sample(a reagent blank is analyzed in the case of non-water matrices);
- 1 spiked blank sample (the spiked blank is eliminated in the case of non-water matrices);
- 1 replicate sample;
- 1 replicate spiked sample; and
- 1 known refernece QC sample for at least each 100 samples analyzed.

The instrument is calibrated each run with three standards, and checked every 10 samples.

Analysis of Cyanides, Phenols, Fluoride, Chloride, Nitrate and Nitrite

- All parameters are analyzed using a Technicon Autoanalyzer II GT.
- 3 calibration standards are analyzed at the beginning and end of each batch

- Each batch (up to 80 samples) consists of analyzing one blank, one spiked blank, one duplicate and spiked sample every 20 samples, and an EPA known reference sample.

Analysis of Total Organic Carbon (TOC)

TOC samples are analyzed on a daily basis with the number of samples analyzed per day dependent on the request for duplicate or quadruplicate analyses. The quality control program is designed to maintain the appropriate amount of QC and consists of the following elements.

- Daily instrument calibration
- One blank
- Standard recalibration every 10 samples
- Spiked samples at a low and high level
- Every sample is run in duplicate at a minimum

Analysis of Total Organic Halide (TOX)

- Blank reagent water for absolute carbon backround must contain less than 5 ug/l of halide (as chloride).
- Using a trichlorophenol standard, the mean adsorption efficiency must be within +/- 15% of the standard value.
- Calibration standards are run every 10 samples.
- Every sample is run in duplicate at a minimum.

Analysis of 2,3,7,8-TCDD (Dioxin) by GC/MS (SIM)

- Each sample is dosed with a known quantity of $^{13}C_{12}$-2,3,7,8-TCDD as internal standard and $^{37}Cl_4$-TCDD as surogate standard. The action limits for surrogate standard results is +/- 40% of the true value. Samples showing surrogate standard results outside of these limits are reextracted and reanalyzed.
- Two laboratory "method blanks" are run along with each set of 24 or fewer samples. The method blank is also dosed with the internal standard and surrogate standard.
- At least one sample per group of 24 samples is run in duplicate to determine intra laboratory precision.
- Qualitative Requirements. The following are met in order to confirm the presence of native 2,3,7,8-TCDD.

  a. Isomer specificity must be demonstrated initially and verified once per 8-hour work shift. The verification consists of injecting a mixture containing TCDD isomers which elute close to 2,3,7,8-TCDD. The 2,3,7,8-TCDD must be separated from interferring isomers, with no more than 25% valley relative to the 2,3,7,8-TCDD peak.

  b. The 320/322 ratio is within the range of 0.67 to 0.87.

  c. Ions 320, 322, and 257 are all present and maximize together the signal to mean noise ratio must be 2.5 to 1 or better for all 3 ions.

  d. The retention time is equal (within 3 seconds) the retention time for the isotopically labeled 2,3,7,8-TCDD.

  e. At least one of the positives can be confirmed by obtaining partial scan spectra from mass 150 to mass 350. The partial scan guidelines are as follows:

. the 320/324 ratio should be 1.58 +/- 0.16

. the 257/259 ratio should be 1.03 +/- 0.10

. the 194/196 ratio should be 1.54 +/- 0.15

- One sample is spiked with native 2,3,7,8-TCDD at a level of 1.0 PPB (for soil) for each set of 24 or fewer samples.
- In cases where no native 2,3,7,8-TCDD is detected, the actual detection limit is estimated and reported based on a signal to noise ratio of 2.5 to 1 at ions 320 and 322.
- For each sample, the internal standard is present with at least a 10 to 1 signal to noise ratio for both mass 332 and mass 334. Also, the internal standard 332/334 ratio must be within the range of 0.67 to 0.87.

Subcontractor QA/QC

Each subcontractoer is required to maintain an appropriate level of quality control. To insure this, each subcontractor is required to submit to ETC the quality control data for all analyses it performs. This data is kept on file at ETC. In general, the amount of quality control required is one duplicate sample with one spiked sample for every ten analyses.

Chain-of-Custody

The chain-of-custody procedure is part of our quality assurance protocol. We believe our chain-of-custody record fully complies with the legal requirements of federal, state and local government agencies and of the courts of law. The record covers:

- labeling of sample bottles, packing the Sample Shuttle and transferring the Shuttle under seal to the custody of a shipper;
- outgoing shipping manifests;
- the chain-of-custody form completed by the person(s) breaking the Shuttle seal, taking the sample, resealing the Shuttle and transferring custody to a shipper.
- incoming shipping manifests;
- breaking the Shuttle's reseal.
- storing each labeled sample bottle in a secured area;
- disposition of each sample to an analyst or technician; and
- the use of the sample in each bottle in a testing procedure appropriate to the intended purpose of the sample.

The records show for each link in this process:

- the person with custody; and
- the time and date each person accepted or relinquished custody.

Appendix A

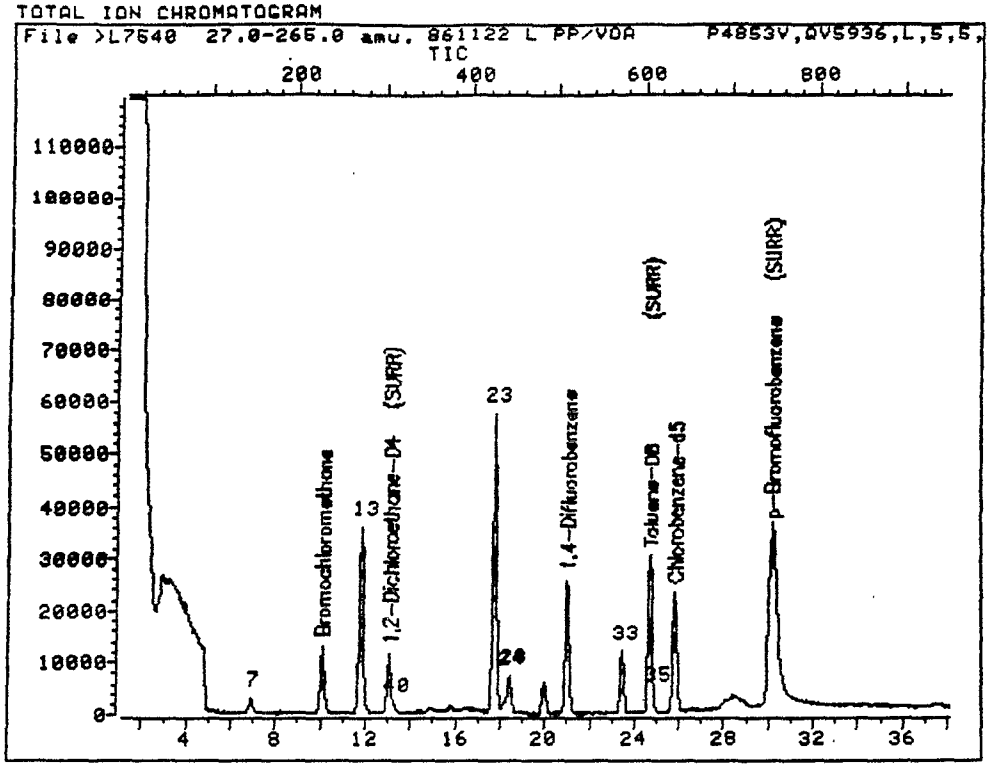
Mass Spectral Data for Quantitated Compounds

1. A total ion chromatogram for each sample analyzed by a GC/MS instrument.

2. A Quant report used by the analyst to determine qualitative and quantitative results of the compounds present.

3. A mass spectrum and a reference spectrum for each priority pollutant compound detected in the sample.

TOTAL ION CHROMATOGRAM



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Name: 861122 L PP/VOA
Misc: P4853V,QV5936,L,5,5,

Id File: LVOA::US
Title: Volatile Priority Pollutant ID FILE
Last Calibration: 861123 05:33

Operator ID: JQ6275
Quant Time: 861123 09:51
Injected at: 861123 09:12

QUANT REPORT

Operator ID: JQ6275 Quant Rev: 6 Quant Time: 861123 09:51
Output File: ^L7540::AQ Injected at: 861123 09:12
Data File: >L7540::U2 Dilution Factor: 1.00000
Name: 861122 L PP/VOA
Misc: P4853V,QV5936,L,5,5,

ID File: LVOA::US
Title: Volatile Priority Pollutant ID FILE
Last Calibration: 861123 05:33

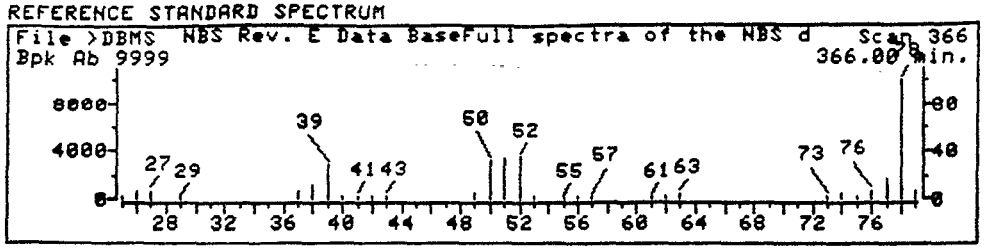
	Compound		R.T.	Scan#	Area	Conc	Units	q
1)	*Bromochloromethane		10.09	231	27080	250.00	NG	92
7)	Methylene chloride		6.94	150	6462	~~107.81~~	NG 99.65	94
13)	1,2-Trans-dichloroethylene		11.84	276	148354	750.16	NG	99
16)	*1,4-Difluorobenzene		21.01	512	123058	250.00	NG	94
17)	1,2-Dichloroethane-D4	(SURR)	13.08	308	24542	242.96	NG	82
23)	Trichloroethylene		17.75	428	114888	512.54	NG	99
24)	Benzene		18.41	445	7959	67.59	NG	83
~~28)~~	~~bis(Chloromethyl)ether~~		~~18.45~~	~~446~~	~~2571~~	~~41.76~~	~~NG~~	~~100~~
30)	*Chlorobenzene-d5		25.83	636	94499	250.00	NG	84
33)	Tetrachloroethylene		23.46	575	23637	98.31	NG	89
34)	Toluene-D8	(SURR)	24.71	607	140880	244.68	NG	87
~~35)~~	~~Toluene~~		~~24.90~~	~~612~~	~~2004~~	~~3.35~~	~~NG~~	~~87~~
38)	p-Bromofluorobenzene	(SURR)	30.16	747	85124	240.04	NG	
40)	Methyl ethyl ketone		13.31	314	11187	67.15	NG	

* Compound is ISTD

SMC 11/26/86

305290

REFERENCE STANDARD SPECTRUM



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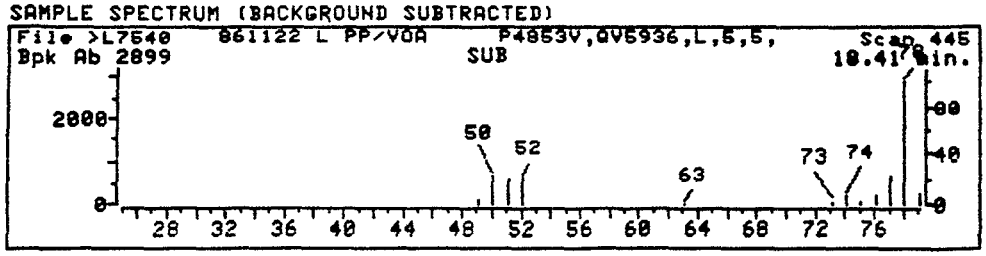

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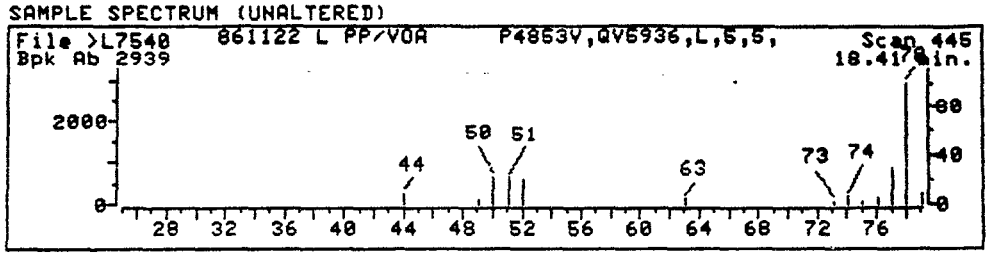

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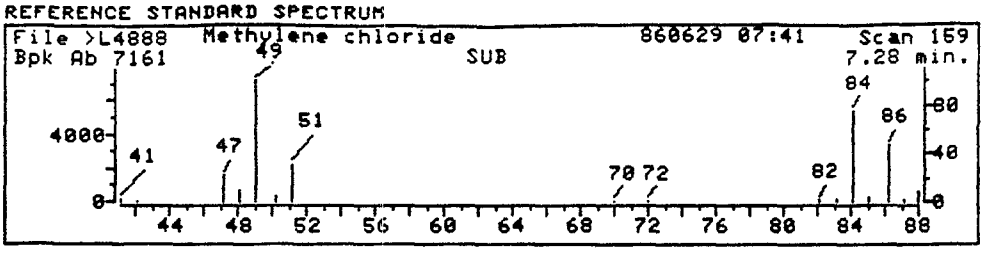
Quant Time: 861123 09:51
Injected at: 861123 09:12

Quant Output File: ^L7540::AQ

Quant ID File: LVOA::US
Last Calibration: 861123 05:33

Compound No: 24
Compound Name: Benzene
Scan Number: 445
Retention Time: 18.41 min.
Quant Ion: 50.0
Area: 7959
Concentration: 67.59 NG
q-value: 83

REFERENCE STANDARD SPECTRUM



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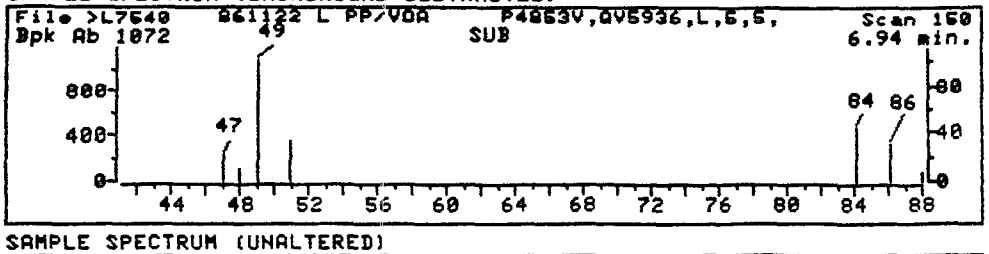

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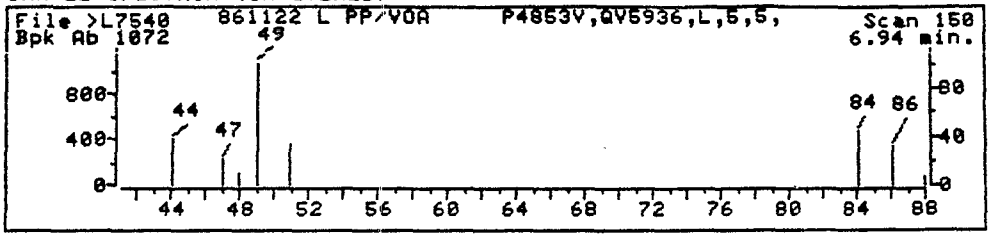

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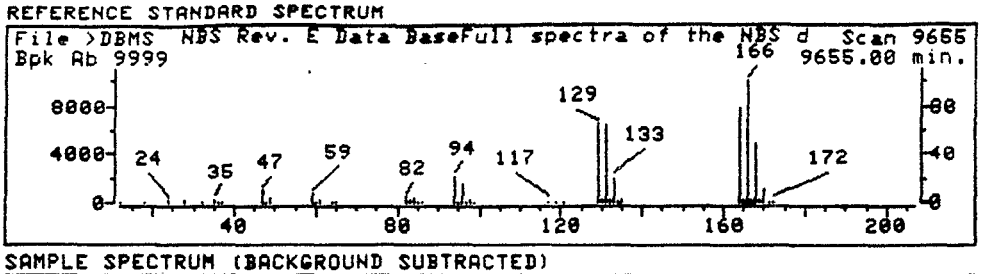
Misc: P4853V,QV5936,L,5,5,
Quant Time: 861123 09:51 Quant ID File: LVOA::US
Injected at: 861123 09:12 Last Calibration: 861123 05:33

Compound No: 7
Compound Name: Methylene chloride
Scan Number: 150
Retention Time: 6.94 min.
Quant Ion: 84.0
Area: 6462
Concentration: 107.81 NG
q-value: 94

305292

REFERENCE STANDARD SPECTRUM



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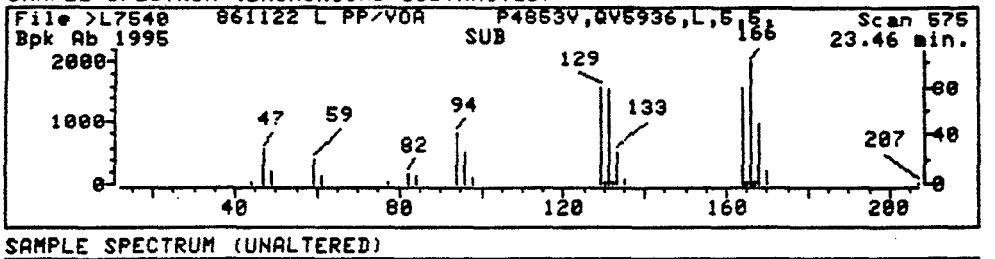

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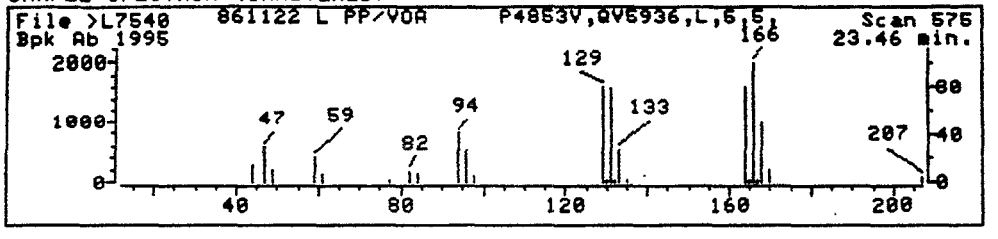

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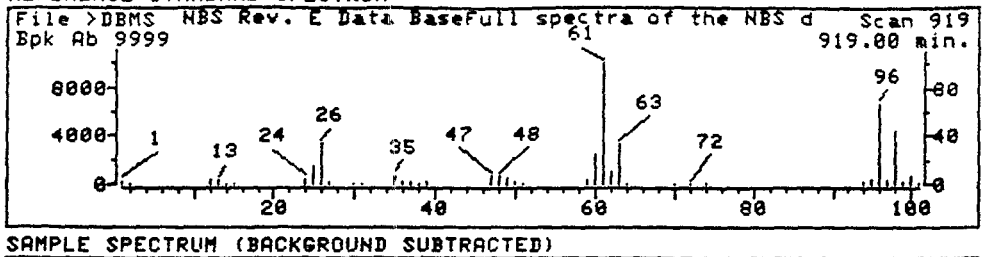
Misc: P4853V,QV5936,L,5,5,
Quant Time: 861123 09:51
Injected at: 861123 09:12

Quant Output File: ^L7540::AQ
Quant ID File: LVOA::US
Last Calibration: 861123 05:33

Compound No: 33
Compound Name: Tetrachloroethylene
Scan Number: 575
Retention Time: 23.46 min.
Quant Ion: 166.0
Area: 23637
Concentration: 98.31 NG
q-value: 89

REFERENCE STANDARD SPECTRUM



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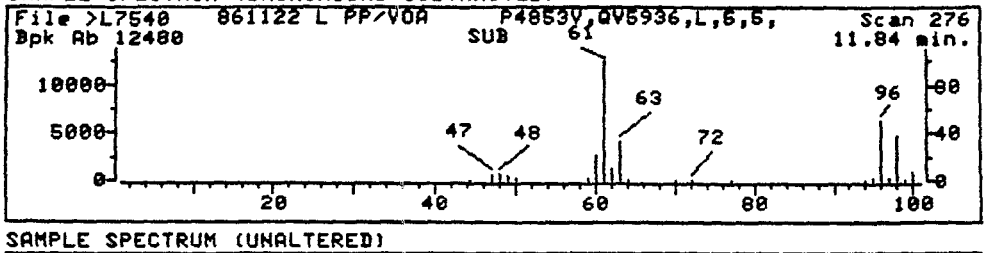

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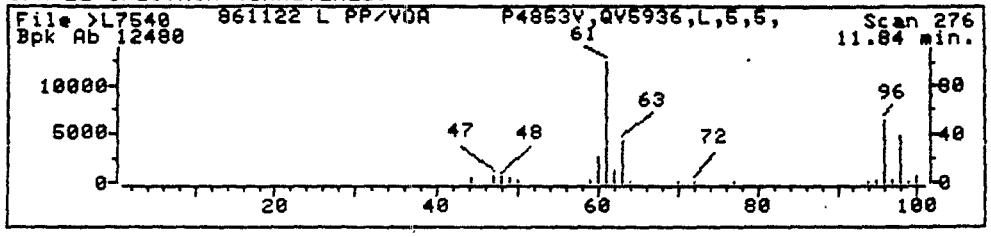

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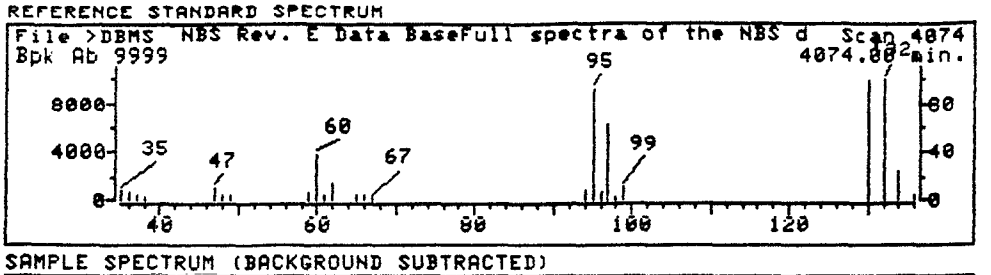
Misc: P4853V,QV5936,L,5,5,
Quant Time: 861123 09:51 Quant ID File: LVOA::US
Injected at: 861123 09:12 Last Calibration: 861123 05:33

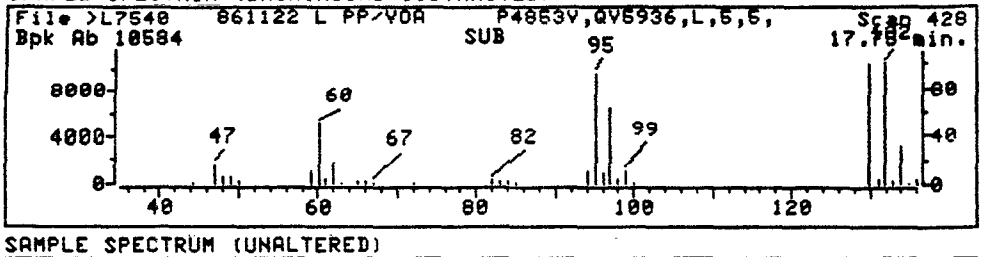
Compound No: 13
Compound Name: 1,2-Trans-dichloroethylene
Scan Number: 276
Retention Time: 11.84 min.
Quant Ion: 61.0
Area: 148354
Concentration: 750.16 NG
q-value: 99

305294

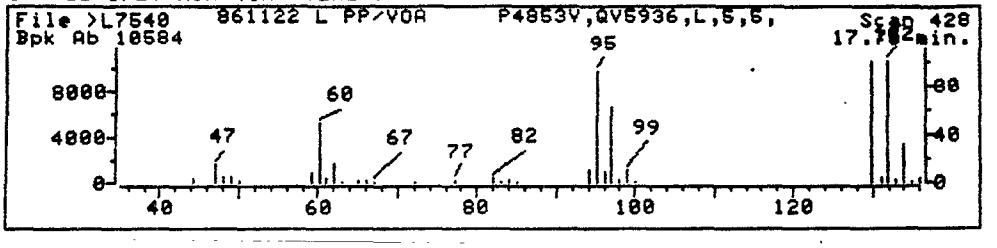
REFERENCE STANDARD SPECTRUM



SAMPLE SPECTRUM (BACKGROUND SUBTRACTED)



SAMPLE SPECTRUM (UNALTERED)

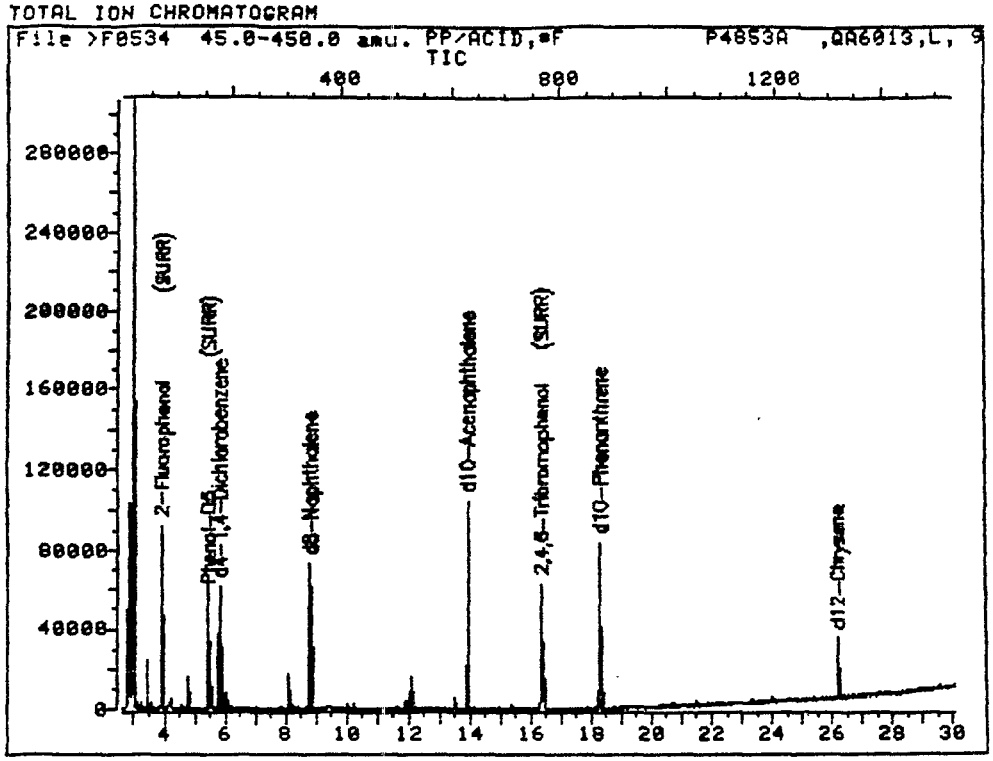


Data File: >L7540::U2
Name: 861122 L PP/VOA
Misc: P4853V,QV5936,L,5,5,
Quant Time: 861123 09:51
Injected at: 861123 09:12

Quant Output File: ^L7540::AQ
Quant ID File: LVOA::US
Last Calibration: 861123 05:33

Compound No: 23
Compound Name: Trichloroethylene
Scan Number: 428
Retention Time: 17.75 min.
Quant Ion: 95.0
Area: 114888
Concentration: 512.54 NG
q-value: 99

TOTAL ION CHROMATOGRAM



Data File: >F0534::U3 Quant Output File: ^F0534::AQ
Name: PP/ACID,#F
Misc: P4853A ,QA6013,L, 930,1 BTL#10

Id File: FACID::US
Title: PP/ACID IDFILE
Last Calibration: 861126 11:03

Operator ID: JA4996
Quant Time: 861126 18:27
Injected at: 861126 17:54

305296

QUANT REPORT

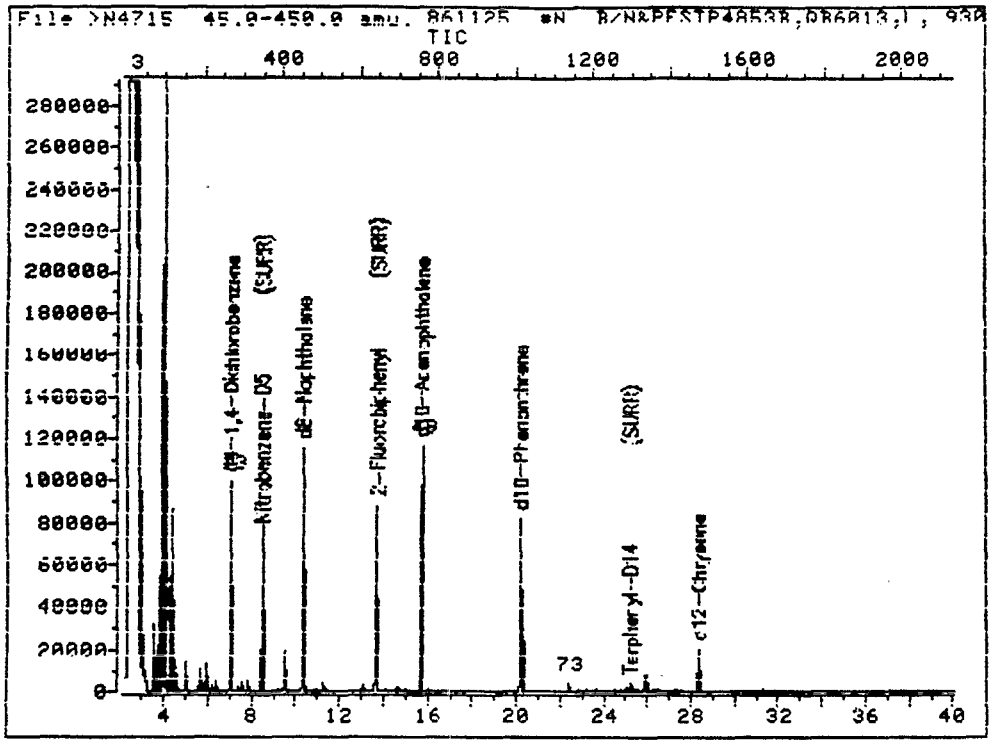
Operator ID: JA4996 Quant Rev: 6 Quant Time: 861126 18:27
Output File: ^F0534::AQ Injected at: 861126 17:54
Data File: >F0534::U3 Dilution Factor: 1.00000
Name: PP/ACID,#F
Misc: P4853A _,QA6013,L, 930,1 BTL#10

ID File: FACID::US
Title: PP/ACID IDFILE
Last Calibration: 861126 11:03

	Compound		R.T.	Scan#	Area	Conc	Units	q
1)	*d4-1,4-Dichlorobenzene		5.78	175	28442	40.00	UG/ML	95
3)	2-Fluorophenol	(SURR)	3.89	69	44528	87.45	UG/ML	80
9)	Phenol-D5	(SURR)	5.42	155	68076	87.47	UG/ML	91
12)	*d8-Naphthalene		8.77	342	77573	40.00	UG/ML	97
18)	*d10-Acenaphthalene		13.90	629	52966	40.00	UG/ML	96
25)	*d10-Phenanthrene		18.27	873	81641	40.00	UG/ML	99
26)	2,4,6-Tribromophenol	(SURR)	16.34	765	22297	72.28	UG/ML	99
29)	*d12-Chrysene		26.18	1315	30010	40.00	UG/ML	100

* Compound is ISTD

TOTAL ION CHROMATOGRAM



Data File: >N4715::U4 Quant Output File: ^N4715::AW
Name: 861125 #N B/N&PEST
Misc: P4865B,WB6013,L, 950,1 BIL#42

Id File: NBNP::US
Title: B/N+PEST ID FILE
Last Calibration: 861126 12:44

Operator ID: KVU/86
Quant Time: 861127 08:22
Injected at: 861127 04:47

QUANT REPORT

Operator ID: KVU/86 Quant Rev: 6 Quant Time: 86112/ 08:22
Output File: ^N4715::AQ Injected at: 86112/ 04:4/
Data File: >N4/15::04 Dilution Factor: 1.00000
Name: 861125 #N B/N&PEST
Misc: P4853B,QB6013,L, 950,1 BTL#42

ID File: NBNP::US
Title: B/N+PEST ID FILE
Last Calibration: 861126 12:44

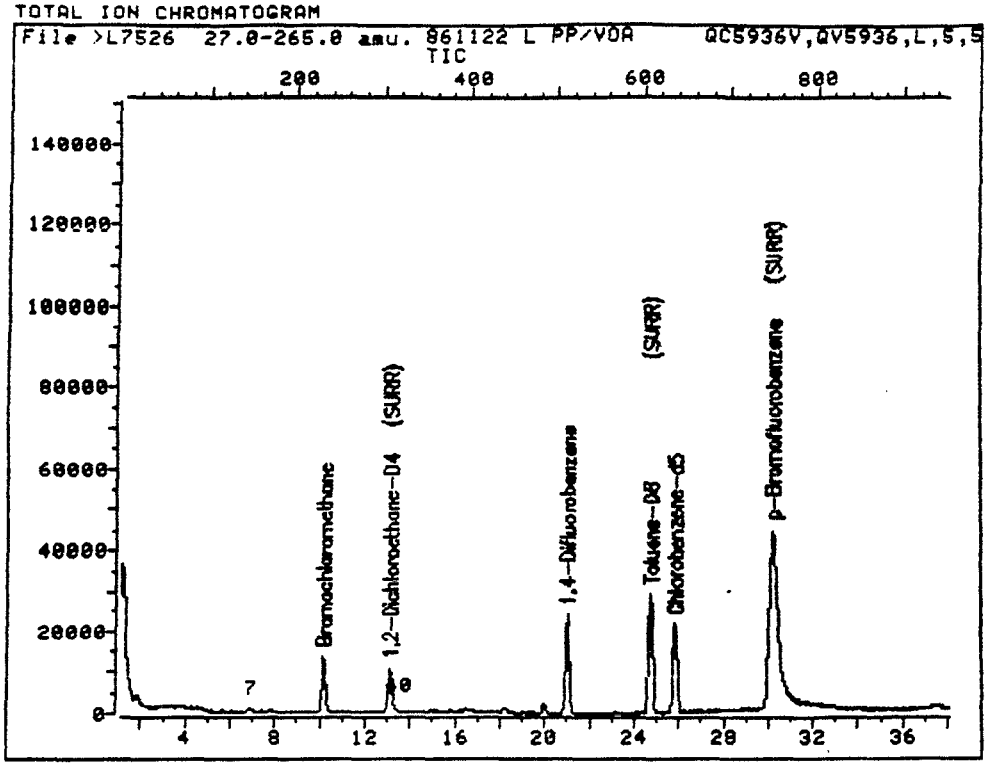
	Compound		R.T.	Scan#	Area	Conc	Units	q
1)	*d4-1,4-Dichlorobenzene		6.99	268	30663	40.00	UG/ML	95
3)	N-Nitrosodimethylamine		2.64	23	8824	~~11.0/~~	~~UG/ML~~	100
12)	Nitrobenzene-D5	(SURR)	8.39	347	80015	44.0/	UG/ML	80
13)	bis(2-Chloroisopropyl)ether		6.99	268	1714	~~2.14~~	~~UG/ML~~	92
21)	*d8-Naphthalene		10.29	454	148418	40.00	UG/ML	98
22)	2-Fluorobiphenyl	(SURR)	13.64	643	79883	29.4/	UG/ML	9/
42)	*d10-Acenaphthalene		15.64	756	76092	40.00	UG/ML	98
49)	Dimethyl phthalate		15.64	756	20090	~~8.01~~	~~UG/ML~~	9/
66)	*d10-Phenanthrene		20.14	1010	9/172	40.00	UG/ML	9/
/3)	Di-n-butyl phthalate		22.34	1134	6344	~~2.01~~	~~UG/ML~~	93
85)	*d12-Chrysene		28.34	1472	24567	40.00	UG/ML	100
98)	Terphenyl-D14	(SURR)	25.20	1295	4444	6.0/	UG/ML	93

* Compound is ISTD

DS
11/29/88

Appendix C1
GC/MS Subsidiary Data

TOTAL ION CHROMATOGRAM



Data File: >L7526::U1 Quant Output File: ^L7526::AQ
Name: 861122 L PP/VOA
Misc: QC5936V,QV5936,L,5,5,

Id File: LVOA::US
Title: Volatile Priority Pollutant ID FILE
Last Calibration: 861123 05:33

Operator ID: JQ6275
Quant Time: 861123 05:56
Injected at: 861122 21:45

QUANT REPORT

Operator ID: JQ6275 Quant Rev: 6 Quant Time: 861123 05:56
Output File: ^L7526::AQ Injected at: 861122 21:45
Data File: >L7526::U1 Dilution Factor: 1.00000
Name: 861122 L PP/VOA
Misc: QC5936V,QV5936,L,5,5,

ID File: LVOA::US
Title: Volatile Priority Pollutant ID FILE
Last Calibration: 861123 05:33

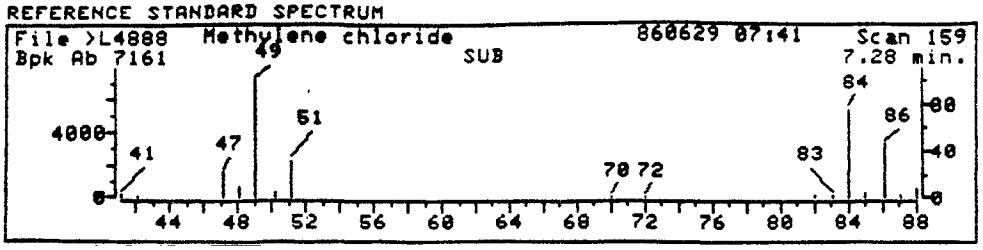
	Compound		R.T.	Scan#	Area	Conc	Units	q
1)	*Bromochloromethane		10.16	233	27932	250.00	NG	99
7)	Methylene chloride		6.90	149	2359	38.16	NG	97
16)	*1,4-Difluorobenzene		21.01	512	115376	250.00	NG	96
17)	1,2-Dichloroethane-D4	(SURR)	13.12	309	22560	238.21	NG	82
30)	*Chlorobenzene-d5		25.83	636	90031	250.00	NG	84
34)	Toluene-D8	(SURR)	24.75	608	135260	246.57	NG	89
38)	p-Bromofluorobenzene	(SURR)	30.20	748	86108	254.86	NG	97
~~40)~~	~~Methyl ethyl ketone~~		~~13.35~~	~~315~~	~~11888~~	~~74.48~~	~~NG~~	~~92~~

* Compound is ISTD

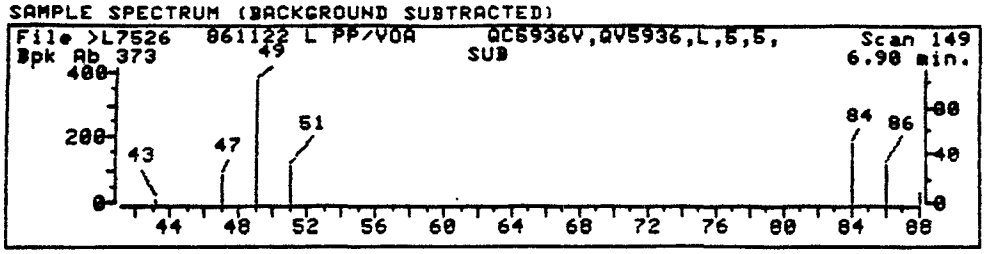
SMC 11125184

305302

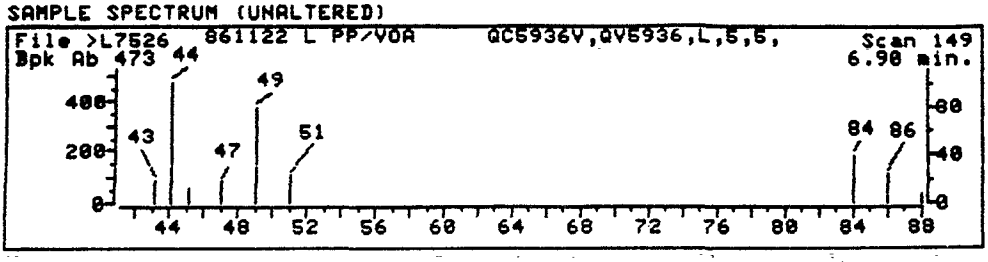
REFERENCE STANDARD SPECTRUM



SAMPLE SPECTRUM (BACKGROUND SUBTRACTED)



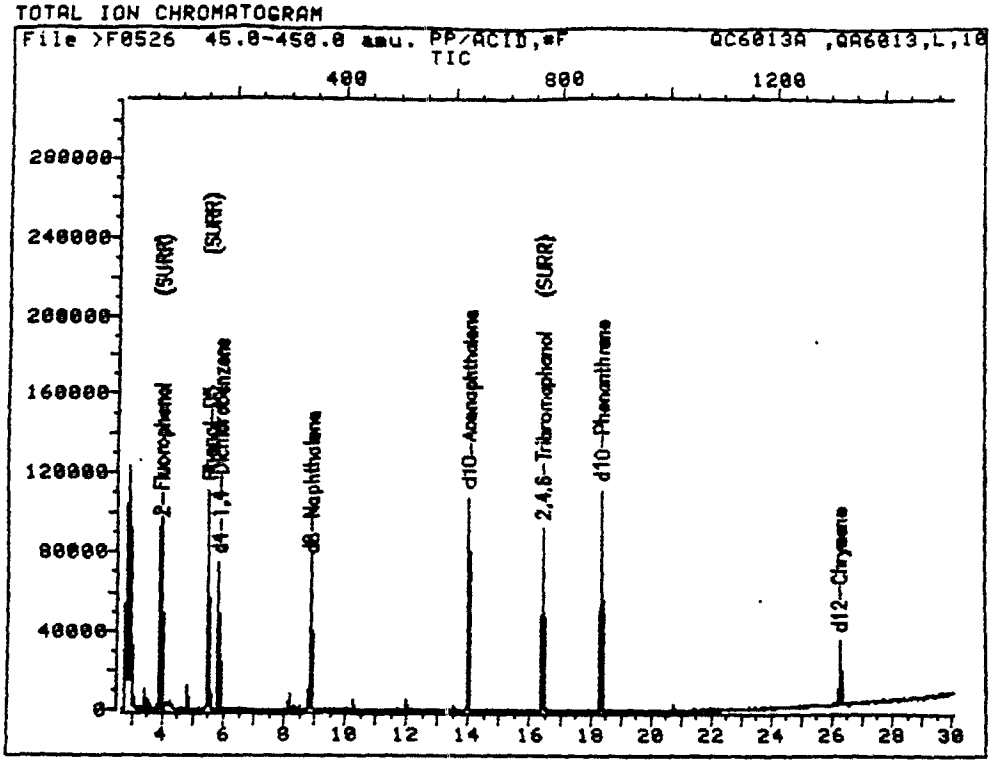
SAMPLE SPECTRUM (UNALTERED)



Data File: >L7526::U1 Quant Output File: ^L7526::AQ
Name: 861122 L PP/VOA
Misc: QC5936U,QV5936,L,5,5,
Quant Time: 861123 05:56 Quant ID File: LVOA::US
Injected at: 861122 21:45 Last Calibration: 861123 05:33

Compound No: 7
Compound Name: Methylene chloride
Scan Number: 149
Retention Time: 6.90 min.
Quant Ion: 84.0
Area: 2359
Concentration: 38.16 NG
q-value: 97

TOTAL ION CHROMATOGRAM



Data File: >F0526::U3 Quant Output File: ^F0526::AQ
Name: PP/ACID,*F
Misc: QC6013A ,QA6013,L,1000,1 BTL# 2

Id File: FACID::US
Title: PP/ACID IDFILE
Last Calibration: 861126 11:03

Operator ID: JA4996
Quant Time: 861126 13:17
Injected at: 861126 12:45

QUANT REPORT

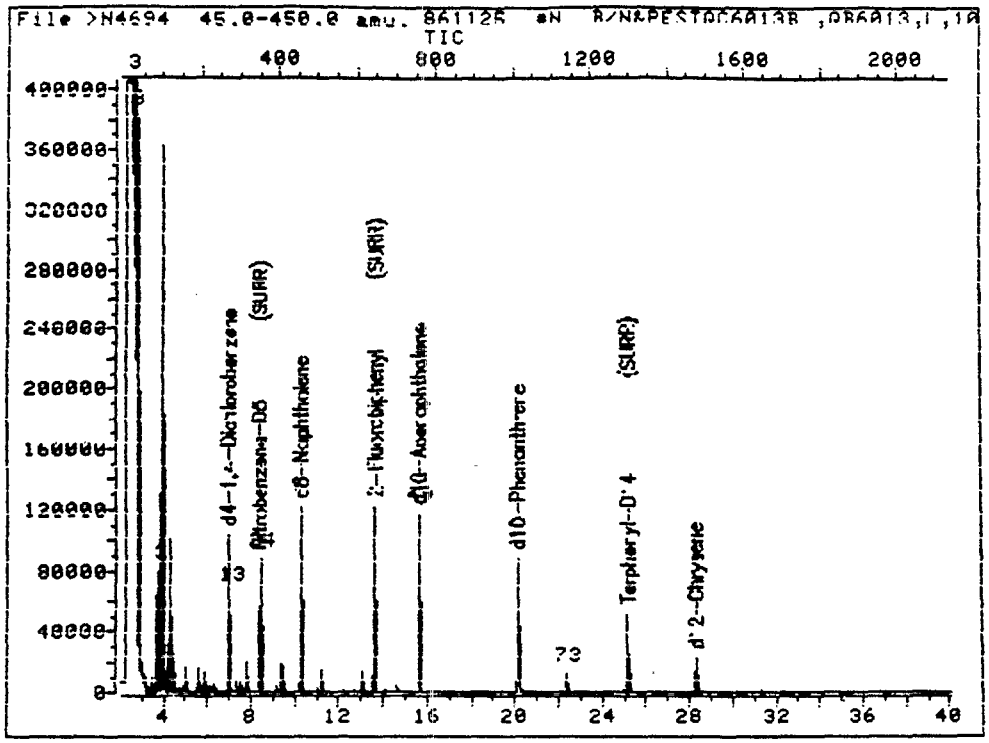
Operator ID: JA4996 Quant Rev: 6 Quant Time: 861126 13:17
Output File: ^F0526::AQ Injected at: 861126 12:45
Data File: >F0526::U3 Dilution Factor: 1.00000
Name: PP/ACID,#F
Misc: QC6013A ,QA6013,L,1000,1 BTL# 2

ID File: FACID::US
Title: PP/ACID IDFILE
Last Calibration: 861126 11:03

	Compound		R.T.	Scan#	Area	Conc	Units	q
1)	*d4-1,4-Dichlorobenzene		5.81	171	35658	40.00	UG/ML	89
3)	2-Fluorophenol	(SURR)	3.88	63	69006	108.10	UG/ML	76
9)	Phenol-D5	(SURR)	5.47	152	85528	87.66	UG/ML	96
12)	*d8-Naphthalene		8.83	340	86861	40.00	UG/ML	98
18)	*d10-Acenaphthalene		13.97	627	56444	40.00	UG/ML	97
25)	*d10-Phenanthrene		18.33	871	102168	40.00	UG/ML	99
26)	2,4,6-Tribromophenol	(SURR)	16.40	763	32589	84.42	UG/ML	97
29)	*d12-Chrysene		26.24	1313	29616	40.00	UG/ML	100

* Compound is ISTD

TOTAL ION CHROMATOGRAM



Data File: >N4694::U4 Quant Output File: ^N4694::AW
Name: 861125 #N B/N&PEST
Misc: WC6013B ,WB6013,L,1000,1 BTL#21

Id File: NBNP::U5
Title: B/N+PEST ID FILE
Last Calibration: 861126 12:44

Operator ID: KVU/86
Quant Time: 861126 16:26
Injected at: 861126 11:25

305306

QUANT REPORT

Operator ID: KV0786 Quant Rev: 6 Quant Time: 861126 16:26
Output File: ^N4694::AQ Injected at: 861126 11:29
Data File: >N4694::U4 Dilution Factor: 1.000000
Name: 861125 #N B/N&PEST
Misc: QC6U13B ,QB6U13,L,1000,1 BIL#21

ID File: NBNP::US
Title: B/N+PEST ID FILE
Last Calibration: 861126 12:44

	Compound		R.T.	Scan#	Area	Conc	Units	q
1)	*d4-1,4-Dichlorobenzene		6.95	267	54441	40.00	UG/ML	98
3)	N-Nitrosodimethylamine		2.66	25	10063	~~11.24~~	~~UG/ML~~	100
3)	N-Nitrosodimethylamine		2.76	31	1340	~~1.50~~	~~UG/ML~~	100
3)	N-Nitrosodimethylamine		3.78	88	2107	~~2.35~~	~~UG/ML~~	100
12)	Nitrobenzene-D5	(SURR)	8.35	346	84430	41.40	UG/ML	83
13)	bis(2-Chloroisopropyl)ether		6.97	268	1836	~~6.80~~	~~UG/ML~~	74
21)	*d8-Naphthalene		10.25	453	144769	40.00	UG/ML	98
22)	2-Fluorobiphenyl	(SURR)	13.63	643	107010	40.47	UG/ML	97
24)	N-Nitrosodi-n-propylamine		8.35	346	12555	~~10.77~~	~~UG/ML~~	66
42)	*d10-Acenaphthalene		15.61	755	73999	40.00	UG/ML	97
49)	Dimethyl phthalate		15.61	755	18965	~~2.48~~	~~UG/ML~~	56
66)	*d10-Phenanthrene		20.11	1009	102784	40.00	UG/ML	96
73)	Di-n-butyl phthalate		22.31	1133	17098	5.13	UG/ML	97
85)	*d12-Chrysene		28.30	1471	25929	40.00	UG/ML	100
98)	Terphenyl-D14	(SURR)	25.18	1295	49419	65.95	UG/ML	94

* Compound is ISTD

WD
11/19/86

305307

Appendix D
Subcontractor's Data

1) A copy of the originating subcontractor's report is included for all data not generated within ETC's laboratory.

ETC ENVIRONMENTAL TESTING and CERTIFICATION

Subcontracted Analytical Results

REV.

ETC Job # 8418131

Lab ID: L86272-64

Submitted by: SN/CHYUN

Date: 11-24-86

Facility: _____ (Facility Code)

Sample Point: _____ — _____ (Source Code — Sample Point ID)

Date Sampled: _____ (Y Y M M D D)

Time Sampled: _____ (H H : M M)

Line No.	Parameter	Table	Units Of Measure	Value	MDL	Comments
CONVENTIONALS						
1	Chloride	QR 10	mg/l			
2	Fluoride	QR 10	mg/l			
3	Nitrate as N	QR 10	mg/l			
4	Sulfate as SO4	QR 10	mg/l	270	2	
5	Phenolics, Total	QR 10	mg/l			
6	Total Organic Halides (TOX)	QR 10	ug/l			
	Total Organic Halides (TOX)	QR 10	ug/l			
	Total Organic Halides (TOX)	QR 10	ug/l			
	Total Organic Halides (TOX)	QR 10	ug/l			
7	Total Organic Carbon	QR 10	mg/l			
	Total Organic Carbon	QR 10	mg/l			
	Total Organic Carbon	QR 10	mg/l			
	Total Organic Carbon	QR 10	mg/l			
8	Specific Conductance (Lab)	QR 10	um/cm			
	Specific Conductance (Lab)	QR 10	um/cm			
	Specific Conductance (Lab)	QR 10	um/cm			
	Specific Conductance (Lab)	QR 10	um/cm			
9	pH (Lab)	QR 10	std			
	pH (Lab)	QR 10	std			
	pH (Lab)	QR 10	std			
	pH (Lab)	QR 10	std			
10	Coliform, Total	QR 10	C/100			
11	Coliform, Fecal	QR 10	C/100			
12	Gross Alpha	QR 10	PCi/l			
13	Gross Beta	QR 10	pCi/l			
14	Acidity as CaCO3		mg/l			
15	Alkalinity as CaCO3		mg/l			
16	Ammonia as N		mg/l			
17	Bicarbonate as CaCO3		mg/l			
18	Biochemical Oxygen Demand		mg/l			
19	Carbonate as CaCO3		mg/l			
20	Chemical Oxygen Demand		mg/l			
21	Color, Apparent (Lab)		Pt/Co			
22	Cyanide, Total		mg/l			
23	Hardness as CaCO3		mg/l			
24	Nitrite as N		mg/l			
25	Nitrogen Total Kjeldahl (TKN)		mg/l			
26	Nitrogen, Total Organic		mg/l			
27	Odor (Lab)		TON			
28	Oil and Grease (grav, IR)		mg/l			
29	Phosphate, ortho		mg/l			
30	Phosphate, Total		mg/l			
31	Solids, Total		mg/l			
32	Solids, Total Dissolved (ROE) 180°		mg/l			
33	Solids, Total Suspended		mg/l	14,000	2	
34	Sulfide as S		mg/l			
35	Surfactants (MBAS/LAS)		mg/l			
36	Turbidity (Lab)		NTU			

305309

Appendix E

Chain-of Custody Forms

1. A field Chain-of-Custody form (COC) is included for all samples shipped by ETC shuttle.
2. An in-house sample Chain-of Custody form is included for all samples not shipped by ETC shuttle.
3. Any additional Chain-of-Custody material provided by a client or by a client's sampling agent is also included.
4. A subcontractor's Chain-of-Custody form is included for any analytical work not performed within ETC's laboratory.
5. Analysis and Extraction Custody forms are included for the period the sample was in ETC's possession.

ETC ENVIRONMENTAL TESTING and CERTIFICATION

ORIGINAL

CHAIN OF CUSTODY FORM (CC1)

Seal No. 67755 ETC Job # P4853

Date Sealed 6 NOV. 1986 By: M.I.

Company: HELLERTOWN MANUFACTURING Attn.: MARK SCHULTZ

Facility/Site: C/O GUARD OFFICE-SILVER ROAD Phone:

Address: HELLERTOWN, PA. 18055

SAMPLE IDENTIFICATION

Facility: CHAMPION (Facility/Site Code) (Optional Sample Point Descriptions)

Sample Point: W - GSP-4 (Source Code (from below); Your Sample Point ID (left justify)) 11 10 86 (Start Date (YY/MM/DD)) 1500 (Start Time (2400 hr clock)) (Elapsed Hours (composite))

86/11/10 MB 86/11/13

Source Codes:

Well ..(W) Outfall.... (O) Bottom Sediment ....(B) Surface Impoundment....(I) Leachate Collection Sys.....(C) Other ..... (X)

Soil ...(S) River/Stream .(R) Generation Point.....(G) Treatment Facility .....(T) Lake/Ocean ....(L) Specify

SHUTTLE CONTENTS

BOTTLE No	Type	Size	Preserv.	ANALYSIS	SAMPLER Filt. (Y/N)	SAMPLER Observations	LAB Observations
1	M	500 ML	HNO3	METALS			✓
1	PN	125 ML	H2SO4	PHENOLS			✓
1	B	125 ML	H2SO4	NITRATE			✓
1	CN	125 ML	NAOH	CYANIDE			✓
1	A	500 ML	BAKED	SOLIDS, TD/SULFATE			✓
1	D	500 ML	DI RINSE	FLUORIDE			✓
2	V	40 ML	SOD. THIOL.	VOA			✓
3	E	1 L	BAKED	EXTRACTABLES			✓
1	TB	40 ML	GC/MS H20	TRIP BLANK			✓

CHAIN OF CUSTODY CHRONICLE

1. Shuttle Opened By: (print) M. SCHULTZ Date: 11-10-86 Time:
   Signature: Mark Schultz Seal #: Intact:

2. I have received these materials in good condition from the above person.
   Name: Signature:
   Date: Time: Remarks:

3. I have received these materials in good condition from the above person.
   Name: Signature:
   Date: Time: Remarks:

4. Shuttle Sealed By: (print) M. SCHULTZ Date: 11-10-86 Time: 16 30
   Signature: Mark Schultz Seal #: 0067756 Intact:

LAB USE ONLY Opened By: Mark Schstadt Date: 11/11/86 Time: 5:18 PM

SHUTTLE # 1318 TEMP. °C 12 SEAL # 67756 COND. INTACT

305311

ETC ENVIRONMENTAL TESTING and CERTIFICATION

FIELD PARAMETER FORM (CC2)

ETC JOB # P4853

Sample Point [W] [GSP1-4] (Source Code / Sample Point I D)

FIELD PROCEDURES

PURGE DATE (YY MM DD) | START PURGE (2400 Hr Clock) | ELAPSED HRS | WATER VOL IN CASING (Gallons) | VOLUME PURGED (Gallons)

SAMPLING METHOD: _____

Sampler Type [ ] A-Submersible Pump, B-ISCO, C-Bladder Pump, D-Dipper/Bottle, E-Bailer, F-Scoop/Shovel, X-Other _____ (SPECIFY OTHER)

Sampler Material [ ] A-Teflon, B-Metal, C-PVC, D-Plastic, X-Other _____ (SPECIFY OTHER)

Tubing Material [ ] A-Teflon, B-Tygon, C-Polyethylene, D-Silicon, X-Other _____ (SPECIFY OTHER)

Sample Composited [Y/N] _____ Procedure/Proportions

FIELD MEASUREMENTS

Well Elevation (ft/msl) _____ Well Depth (ft) _____

Depth to Ground water (ft) _____ Sample Depth (non-well) (ft) _____

Groundwater Elevation (ft msl) _____

	ph	(STD)		spec. cond.	um/cm at 25° C	(other parameter)	value	units
1st		(STD)	1st		um/cm at 25 °C			
2nd		(STD)	2nd		um/cm at 25 °C			
3rd		(STD)	3rd		um/cm at 25 °C			
4th		(STD)	4th		um/cm at 25 °C			

Sample Temp _____ (°C) Turbidity _____ NTU

FIELD COMMENTS

Sample Appearance: _____

Weather Conditions: _____

Other: _____

FILTERING: Use Chain of Custody (CC1) to indicate which bottles were filtered

Sampler: _____ (Print) Employer: _____

I certify that sampling procedures were in accordance with applicable EPA state and corporate protocols.

_____ (Signature)

305312

ORIGINAL

p1/2

ETC ENVIRONMENTAL TESTING and CERTIFICATION

LABORATORY CHRONICLE: GC-MS Department

DATE 861123 SHIFT ______
FRACTION VOA
INSTRUMENT L
TUNE FILE APEIQ1
SEQUENCE FILE VQL
METHOD FILE VOAL
ID FILE LVOA
ANALYST(S) [signature]
SUPERVISOR [signature]
BATCH #'s QV5936

STANDARD	CONC PPM	LOT NO.	LOT VOL.
p-BFB	50	13755	1
Internal Std &	25	13747	10
Surrogate	25	14671	10
ABC/XVOA	18	14664A	5,10,30

(PLEASE INITIAL)

CURRENT CS05 STATUS		STANDARDS UPDATED	
ACQ		DATE	11/23/86
WIP		BY	[initials]

NAME	DATA FILE	uL INJ	ALS #	DIL	TAPE #	SPECIALS (WRITE A-TYPE)	PLUS Y/N
p-BFB	>L7525	1ul				21:11	
QC5936V	>L7526	5ml	1		OK	21:45	
QC5936VS	>L7527	↓	2			5ul ABC/XVOA	
QC5936VS	>L7528		3			10ul ABC/XVOA 00:01	
QC5936VS	>L7529	↓	4			30ul ABC/XVOA	
p-BFB	>L7530	1ul				00:42	
P5398VS	>L7531	5ml	1		OK	5ul ABC/XVOA	
P5398V	>L7532	↓	2		OK		
P0486V	>L7533		3		OK		
P0486VR	>L7534		4		OK		
P0489V	>L7535		5		OK		
P0493V	>L7536		6		OK		
P0467V	>L7537		7		OK		
P4511V	>L7538		8		OK		
P4512V	>L7539		9		OK		
P4853V	>L7540	↓	10		OK		
P2774V	>L7541	5ml	1		OK		
P2775V	>L7542	↓	2		OK		
P2762V	>L7543		3		OK		
QC5936VS	>L7544	↓	4		OK	12:48	
p-BFB	>L7545	1ul			OK	13:45	
P3325V	>L7546	5ml	1		OK		
P3326V	>L7547	↓	2		OK		
P3327V	>L7548		3		OK		
P3328V	>L7549	↓	4			rerun 3.18.3	

AR305313

ETC ENVIRONMENTAL TESTING and CERTIFICATION

LABORATORY CHRONICLE: GC-MS Department

VV

DATE 11/23/82 SHIFT
FRACTION
INSTRUMENT Joe Page 1
TUNE FILE
SEQUENCE FILE X
METHOD FILE
ID FILE
ANALYST(S) Dave Dallant
SUPERVISOR Stephenson
BATCH #'s QV5936

(PLEASE INITIAL)

CURRENT CS05 STATUS		STANDARDS UPDATED	
ACQ		DATE	
WIP		BY	

STANDARD	CONC PPM	LOT NO.	LOT VOL.
Joe Page 1			

NAME	DATA FILE	uL INJ	ALS #	DIL	TAPE #	SPECIALS (WRITE A-TYPE)	PLUS Y/N
P3329V	>L7550	5ml	5		NB:	rerun for carryover	
P3330V	>L7551	↓	6				
P3331V	>L7552		7				
P3332V	>L7553		8				
P3333V	>L7554		9				
QC5936V	>L7555		4		01	Position check	
P1957V	>L7556	0.002	4	1:2500	02		

305314

ETC ENVIRONMENTAL TESTING and CERTIFICATION

LABORATORY CHRONICLE: GC-MS Department

DATE 861121 SHIFT
FRACTION VOA
INSTRUMENT m
TUNE FILE APETOZ
SEQUENCE FILE 1QM
METHOD FILE VOAM
ID FILE MVOA
ANALYST(S) [signature] [signature]
SUPERVISOR [signature]
BATCH #'s QV5931

(PLEASE INITIAL)

CURRENT CS05 STATUS		STANDARDS UPDATED	
ACQ		DATE	861126
WIP		BY	[signature]

STANDARD	CONC PPM	LOT NO.	LOT VOL.
p-BFB	50	13795	1
Internal Std E	25	13747	10
Surrogate	25	14671	10
ABC/XVOA	18	14664A	5,10,30

NAME	DATA FILE	uL INJ	ALS #	DIL	TAPE #	SPECIALS (WRITE A-TYPE)	PLUS Y/N
p-BFB	>M7497	1ul					
QC5931V	>M7498	5ml	1			06:18	
QC5931VS	>M7499	↓	2		CBUPD	5ul ABC/XVOA	
QC5931VS	>M7500		3		CBCAL	10ul ABC/XVOA	
QC5931VS	>M7501	↓	4			30ul ABC/XVOA 08:43	
p-BFB	>M7502	1ul			OK	09:32	
P4240VS	>M7503	5ml	1		OK		
P4240V	>M7504		2		OK		
P4241VR	>M7505		3		OK		
P4241V	>M7506	↓	4		OK		
P4242V	>M7507	5ml	5		OK		
P4243V	>M7508		6		OK		
P4244V	>M7509		7		OK		
P4236V	>M7510		8		OK		
P4237V	>M7511	↓	9		OK		
② P4239V	>M7512	0.001	10	1:5000		Too Dilute Rerun 1:500	
p-BFB	>M7513	1ul					
QC5931VS	>M7514		10		OK	5ul ABC/XVOA	
② P4239V	>M7515	0.01	1	1:500	OK	For Benzene	
P4235V	>M7516	5ml	2		OK		
P5336V	>M7517		3		OK		
P5415V	>M7518	↓	4		OK		
P5414V	>M7519	0.1ml	5	1:50	OK		
P4850V	>M7520	5ml	6		OK		
P4851V	>M7521	↓	7		OK		

ETC FORM #102

ETC ENVIRONMENTAL TESTING and CERTIFICATION

LABORATORY CHRONICLE: GC-MS Department

DATE 861122 SHIFT
FRACTION VOA
INSTRUMENT 4 m
TUNE FILE APEI02
SEQUENCE FILE J0m
METHOD FILE V0am
ID FILE MVOA
ANALYST(S) J Quinn
SUPERVISOR Stapleton
BATCH #'s QV5931

(PLEASE INITIAL)

CURRENT CS05 STATUS		STANDARDS UPDATED	
ACO		DATE	
WIP		BY	

STANDARD	CONC PPM	LOT NO.	LOT VOL.
PAGE 2 of 2			

NAME	DATA FILE	uL INJ	ALS #	DIL	TAPE #	SPECIALS (WRITE A-TYPE)	PLUS Y/N
P4852V	>m7522	5ml	8		OK		
P4853V	>m7523	↓	9		NG	rerun carryover	
			~~10~~				

305216

ETC ENVIRONMENTAL TESTING and CERTIFICATION

LABORATORY CHRONICLE: Sample Preparation Department

Sample Number	Log Link	Sample Vol. (ml)	Extract Vol. (ml) BN	Extract Vol. (ml) ACID	Comments
P0447	17862	1000	1.0	1.0	PAH/chlor pest/PCBs
P0448		1000	1.0	1.0	
P0449		1000	1.0	1.0	
P0450		1000	1.0	1.0	
P0457		1000	1.0	1.0	
P0458		1000	1.0	1.0	
P0467		1000	1.0	1.0	
P0468		1000	1.0	1.0	
P0471		1000	1.0	1.0	
~~P0472~~	↓	~~995~~	~~1.0~~	/	↓
P0489	17863	1000	1.0	1.0	PP/T
P0493		980	1.0	1.0	
P0494		1000	1.0	1.0	
P0495	↓	1000	1.0	1.0	↓
P4852	17866	930	1.0	1.0	PAH/chlor pest/PCBs
P4853	↓	930	1.0	1.0	↓
⊕ P0472	17862	1000	/	1.0	
QC 6013		1000	1.0	1.0	
QC 6013 S		1000	1.0	1.0	
P0447 S		980	1.0	1.0	
P0448 R		995	1.0	1.0	

QC Batch # 6013

Analysis SEE COMMENTS

Matrix H_2O

Turnaround NORM

Date 11/17/86

Extraction Method:

Sep. Funnel ~~K.B. 11-17-86~~

Continuous BN ~~ON: 11:00 11-17-86~~ OFF BN ON 11:30 11-18

Soxhlet ACID ON: 1:00pm 11/18/86 OFF: 1:00pm 11/19/8

Other

COMMENTS

⊕ P0472 - Acid fraction lost during conc., Reported using a separate aliquot

FRACTION	SPIKE Amt (ml)	SPIKE Conc. (ug/ml)	SPIKE Lot #
PP/BN	1.0	100	13,929
PP/ACID	1.0	100	13,829
Organochlor 1260	1.0	100	14,404
Pesticide	1.0	100/200	14,631
Semi-VOA			

QC vol. adj.

SURROGATE Amt. (ml)	Conc. (ug/ml)	Lot #
	BNs - 50	14,597
1.0	ACID's - 100	

Set-up: K. Boykin 11-17-86 Doug Dazenski 11-17-86 UPD/Supervisor: 11-25-86

Conc.: K. Boykin 11-24-86 Spike/Surr. Verified: Kenneth Boykin 11-17-86

305317

ETC ENVIRONMENTAL TESTING and CERTIFICATION

LABORATORY CHRONICLE: GC-MS Department

DATE 12-6-88 SHIFT
FRACTION PA/ACID
INSTRUMENT F
TUNE FILE MTF001
SEQUENCE FILE JAFI/JAF
METHOD FILE ACIDF
ID FILE 7ACID
ANALYST(S) J. AO
SUPERVISOR Stapleton
BATCH #'s QA 6013
QA 6056
(PLEASE INITIAL)

CURRENT CS05 STATUS		STANDARDS UPDATED	
ACQ		DATE	
WIP		BY	

STANDARD	CONC PPM	LOT NO.	LOT VOL.
PP/Acid STD	300	14429	
↓	100	14428	
	60	14427	
JAY. STD	400	14585	
Test Mix		14616	

Page 1 of 3

NAME	DATA FILE	uL INJ	ALS #	DIL	TAPE #	SPECIALS (WRITE A-TYPE)	PLUS Y/N
Columa Test Mix	> F 0520					OK	
300 ppm PP/ACID STD	> F 0521					← CBUPP	
100 ppm PP/ACID STD	> 0522					← CBCAF	
60 ppm PP/ACID STD	> 0523					←	
Columa Test Mix	> 0524				11:04	OK	
BC 6013 AS	> 0525		1				
BC 6013A	> 0526		2				
P04547AS	> 0527		3				
P04547A	> 0528		4				
P04548A	> 0529		5				
P04548AR	> F 0530		6				
P04549A	> 0531		7				
P04550A	> 0532		8				
P04852A	> 0533		9				
P04853A	> 0534		10				
P04557A	> 0535		11				
P04558A	> 0536		12				
P04567A	> 0537		13				
P04568A	> 0538		14				
P04571A	> 0539		15				
P04572A	> F 0540		16				
Columa Test Mix	> 0541		17		22:39		
100 ppm PP/ACID STD	> 0542		18			OK	
P04589A	> 0543		19				
P04593A	> F 0544		20				

305318

p 2/2

ETC ENVIRONMENTAL TESTING and CERTIFICATION

LABORATORY CHRONICLE: GC-MS Department

DATE 11-20-86 SHIFT

FRACTION PP/ACID

INSTRUMENT F

TUNE FILE MT7001

SEQUENCE FILE 0AF1/1JAF

METHOD FILE FACIDF

ID FILE FACID

ANALYST(S) JAO

SUPERVISOR Stapounch

BATCH #'s

(PLEASE INITIAL)

CURRENT CS05 STATUS		STANDARDS UPDATED	
ACQ		DATE	
WIP		BY	

STANDARD	CONC PPM	LOT NO.	LOT VOL.
page 8 of 8			

NAME	DATA FILE	uL INJ	ALS #	DIL	TAPE #	SPECIALS (WRITE A-TYPE)	PLUS Y/N
P0494A	>F0545		21				
P0495A	0546		22				
QC6056AS	0547		23				
QC6056A	0548		24				
P5831AS	0549		25				
P5831A	>F0550		26				
P5832A	0551		27				
P5832AR	0552		28				
P5817A	0553		29				
P5818A	0554		30				
P5822A	0555		31				
P5823A	0556		32				
P5825A	0557		33				
P5826A	0558		34				
Colum Test mix	0559		35			10:19 OK	
100ppm PP/ACID STD	>F0560		36			OK	
P5827A	0561		37				
P5828A	0562		38				
P5829A	0563		39				
P5830A	0564		40				
P4974A	0565		41				
P5816A	0566		42	1:5			
P5821A	0567		43	↓			
P5824A	0568		44	↓			
P5820A	0569		45	↓			

LAN 11-30

ETC ENVIRONMENTAL TESTING and CERTIFICATION

LABORATORY CHRONICLE: GC-MS Department

DATE Nov 26 86 SHIFT
FRACTION B/N
INSTRUMENT "N"
TUNE FILE
SEQUENCE FILE XV25
METHOD FILE BNPV; ACIDN
ID FILE N3VP
ANALYST(S) K. Valenti

SUPERVISOR Stanonuch
BATCH #'s QB6057, QB6013

(PLEASE INITIAL)

CURRENT CS05 STATUS		STANDARDS UPDATED	
ACQ		DATE	Nov. 26th 1986
WIP		BY	KV

STANDARD	CONC PPM	LOT NO.	LOT VOL
Pest. IV	150	14433	
B/N IV	200	14432	
B/N II	100	14713	
B/N I	60	14430	
Aniline	300	13468	
Aniline	100	13469	
Aniline	60	13470	
2-Picoline	300	14411	
2-Picoline	100	14412	
2-Picoline	60	14413	
Methoxyaniline	300	14352	
Methoxyaniline	100	14353	
Methoxyaniline	60	14354	
Int. Std.	400	14585	
Col Test Mix	25	14616	

NAME	DATA FILE	uL INJ	ALS #	DIL	TAPE #	SPECIALS (WRITE A-TYPE)		PLUS Y/N
Col Test-Mix	>N4673					OK 14:37		
Pest. cal. std. IV; 150ppm	>N4674		1					
B/N cal std. IV; 200ppm	>N4675		2					
B/N cal std. II; 100ppm	>N4676		3					
B/N cal. std. I; 60ppm	>N4677		4					
Aniline std.; 300ppm	>N4678		5					
Aniline std.; 100ppm	>N4679		6					
Aniline std., 60ppm	>N4680		7					
2-Picoline Methoxyaniline std; 300ppm	>N4681		8					
2-Picoline Methoxyaniline std; 100ppm	>N4682		9					
2-Picoline Methoxyaniline std.; 60ppm	>N4683		10			OK		
Col. Test-Mix	>N4684		11			OK 03:17		
QC6057BS	>N4685		12			AN1260		
P2712BS	>N4686		13			AN1260		
QC6057B	>N4687		14			PCBSCN	S	Y
P2711B	>N4688		15				S	Y
P2711BR	>N4689		16					
P2712B	>N4690		17				S	Y
N6321B	>N4691		18			↓	S	Y
QC6013BS	>N4692		19			AN1260		
P0447BS	>N4693		20			AN1260		
QC6013B	>N4694		21			PCBSCN		
Col. Test-Mix	>N4695		22			OK 12:15		
B/N cal. std. II; 100ppm	>N4696		23			AN1260; OK		
P0447B	>N4697		24			PCBSCN		

1H
130

ETC ENVIRONMENTAL TESTING and CERTIFICATION

LABORATORY CHRONICLE: GC-MS Department

DATE 11/26/86 SHIFT
FRACTION BNP
INSTRUMENT N
TUNE FILE
SEQUENCE FILE
METHOD FILE
ID FILE
ANALYST(S) L. Valent
SUPERVISOR [signature]
BATCH #'s QB6057, QB6013

(PLEASE INITIAL)

CURRENT CS05 STATUS		STANDARDS UPDATED	
ACO		DATE	
WIP		BY	

STANDARD	CONC PPM	LOT NO.	LOT VOL.

NAME	DATA FILE	uL INJ	ALS #	DIL	TAPE #	SPECIALS (WRITE A-TYPE)	PLUS Y/N
P 0448 B	>N4698		25			PCBSCN	
P 0448 BR	>N4699		26				
P 0449 B	>N4700		27				
P 0450 B	>N4701		28				
P 0457 B	>N4702		29				
P 0456 B	>N4703		30				
P 0467 B	>N4704		31				
P 0468 B	>N4705		32				
Col. Test-Mix	>N4706		33			OK 21:29	
BN cal. std. II; 100ppm	>N4707		34			AN1260	
P 0471 B	>N4708		35			PCBSCN	
P 0472 B	>N4709		36				
P 0489 B	>N4710		37				
P 0493 B	>N4711		38				
P 0494 B	>N4712		39				
P 0495 B	>N4713		40				
P 4852 B	>N4714		41				
P 4853 B	>N4715		42				
Col. Test-Mix	>N4716		43				

305321

SUBCONTRACT
REQUEST FOR ANALYSIS
and SAMPLE CHAIN OF CUSTODY

LOGLINK: 17866

MATRIX: WATER

NAME OF SUBCONTRACT LAB: CHYUN

ETC JOB NUMBERS: P4850 P4853
P4851
P4852

TURNAROUND IN DAYS: NORMAL DATE DATA REQUIRED: 11/22
(If deadline cannot be met, contact ETC Subcontract Group).

Send invoice, bill and reports to : ETC Subcontract Group
(201)225-6786

Please perform the analyses requested below:

_____Acidity	_____Alkalinity	_____Ammonia(probe)
_____Ammonia(dist)	_____Bicarbonate	_____BOD(5 day)
_____Bromide	_____Carbonate	_____Chloride
_____Chem.Oxygen Dem.	_____Chromium+6	_____Fecal Coliform
_____Total Coliform	_____Color,apparent	_____Cyanide,total
_____Fluoride	_____Formaldehyde(UV)	_____Hardness
_____Nitrate(NO3)	_____Nitrite(NO2)	_____TKN
_____Odor	_____Oil & Grease(grav)	_____T.Organic Carb.
_____Pet.Hydro(IR)	_____Pet.Hydro(grav)	_____Phenolics,tot.
_____Phenolics(5ug/l)	_____Phosphate(ortho)	_____Phospate(total)
_____Phosphorus(tot.)	_____Silica(dissolved)	X Sulfate(SO4)
_____Sulfide(S)	_____Sulfite(SO3)	_____Surfactant(MBAS
_____Solids,Total	_____Solids,Tot. Diss.	_____Solids,Tot.Set.
X Solids,Tot. Sus.	_____Solids,Tot. Vol.	_____Turbidity
_____Gross Alpha,Beta	_____Radium 226	_____Radium 228

Others: _____

Chain of Custody Section for Courier Pick up at ETC

Sample(s) Relinquished by:(ETC) Frank Ickstadt
Time: 4:30pm Date: 11/5/86
Sample(s) Received by: Mark Kelly
Time: 4:30pm Date: 11/12/86

Chain of Custody Section for Sending Sample from ETC

Sample Shuttle sealed by : _____
Date:____/____/____ Time:_____ Seal Number:_____

Sample Shuttle opened by : _____
Date:____/____/____ Time:_____ Seal Number:_____
Was the Seal intact? _____ Are the shuttle contents in good condition?_____

Chain of Custody Section for Returning Sample to ETC

Sample Shuttle sealed by:_____
Date:____/____/____ Time:_____ Seal Number:_____

Sample Shuttle opened by : _____
Date:____/____/____ Time:_____ Seal Number:_____
Was the Seal intact? _____ Are the shuttle contents in good condition?_____

305322

ETC ENVIRONMENTAL TESTING and CERTIFICATION

CONVENTIONAL CHEMISTRY LAB

ANALYZED ON: 11/26/86

TEST: Fluoride, UNITS: mg/L,
Meth. Ref. #: STD METHOD 413E, MDL: 0.10,
Instrument #: A.A. Channel 7,

BY: [illegible]
BOOK #: CV-12 P. 108
FROM PAGE #: 107

Log Lock	Job #	Analyzed Conc.	Dilu	Reported Conc.	Log Lock	Job #	Analyzed Conc.	Dilu	Reported Conc.
17455	M0831	0.07	–	BMDL	17828	P2472	0.03	–	BMDL
17455	M0703	0.26	10x	2.60	17828	P2473	0.03	–	BMDL
17455	M0704	0.27	10x	2.70	17828	P2522	0.08	–	BMDL
17455	M0705	0.23	10x	2.30	17828	P2536	0.03	–	BMDL
17455	M0706	0.28	10x	2.80	17828	P2548	0.02	–	BMDL
17455	M0707	0.23	10x	2.30	17866	P4850	0.16	–	0.16
17455	M0708	.003	–	BMDL	17866	P4851	0.21	–	0.21
17514	~~[illegible]~~ N6032	0.44	–	0.44	17866	P4852	2.24	–	RPT
17514	~~[illegible]~~ N6033	0.54	–	0.54	17866	P4853	0.98	–	0.98
17749	P2500	0.01	–	BMDL	17250	N9520	1.64	–	1.64
17749	P2513	0.07	–	BMDL	17441	P2237	0.07	–	BMDL
17749	P2514	0.03	–	BMDL	17878	P2776	0.087	–	BMDL
17749	P2515	0.07	–	BMDL	17864	P2481	.006	–	BMDL
17749	P2526	0.04	–	BMDL	17864	P2531	0.02	–	BMDL
17778	P2497	0.03	–	BMDL	17864	P2541	0.04	–	BMDL
17778	P2499	0.03	–	BMDL	17864	P2546	0.02	–	BMDL
17778	P2507	0.13	–	0.13	17864	P2554	0.01	–	BMDL
17778	P2517	0.12	–	0.12					
17798	P2469	0.03	–	BMDL					
17798	P2477	0.05	–	BMDL					
17798	P2524	0.08	–	BMDL					
17798	P2538	0.05	–	BMDL					
17798	P2539	0.04	–	BMDL					
17798	P2540	0.02	–	BMDL					

STANDARDS

PREPED ON ______
BY ______
FROM ______ mg/L
STOCK # ______

STANDARD mg/L	VALUE OBTAINED	% of Theoretical

SLOPE	Intercept	Corr. Coef.

ADDITIONAL COMMENTS

RPT:
N9519 – [illegible]
P4852 – [illegible] instrument [illegible]
Dilute 1:10 and check

Analyses QA/QC Data Report
See CV-12, p 107.

QC Batch #: F1001 + FL003

Verified: [illegible] 11/28/86

METHOD BLANK		
Spiked Blank (Known)		
Spiked Blank Result		
% Recovery		
EXTERNAL REF. QC		
Known Value		
Observed Result		
% Recovery		

PRECISION	
Job # Dup (ETC)	P2472
Original Result	.0297
Duplicate Result	.0339
R Range	.0042
ACCURACY	
Job # Spiked (ETC)	P2472
Original Result	.0313
Amount Spiked	1.00
Spiked S' Result	1.07
% Recovery	104 %

To Page No. ______

ETC ENVIRONMENTAL TESTING and CERTIFICATION

CONVENTIONAL CHEMISTRY LAB

ANALYZED ON: 11-21-86

TEST: NITRATE, UNITS: mg/L,

METH. REF. # 353.2, MDL: 0.10,

INSTRUMENT # #1 (Channel 1),

BY: CH

BOOK # CV-12 P. 97

FROM PAGE # 96

Log Link	Job #	Analyzed Conc.	Dilu	Reported Conc.	Log Link	Job #	Analyzed Conc	Dilu	Reported Conc
7514	N6032	.334	5X	1.67	17866	P4851	.793	10X	7.93
7514	N6033	.0134	5X	Redo	~~17866~~	~~P4852~~	~~.467~~	~~10X~~	
7562	N6122	.804	5X	4.02	17866	P4853	.442	10X	4.42
7503	P2683	.0213	5X	Redo	~~17866~~	~~P4854~~	~~.0192~~	~~10X~~	
17798	P2469	.276	10X	2.76	~~17866~~	~~P3117~~	~~.153~~	~~10X~~	~~1.53~~
17798	P2477	1.54	10X	15.4	~~17866~~	~~P3120~~	~~.0195~~	~~10X~~	
17798	P2524	.517	10X	5.17	~~17866~~	~~P3123~~	~~.0211~~	~~10X~~	
17798	P2538	.583	10X	5.83	~~17866~~	~~P3124~~	~~.0229~~	~~10X~~	
17798	P2534	.856	10X	8.56	~~17866~~	~~P3126~~	~~.0176~~	~~10X~~	
17798	P2540	.618	10X	6.18	17882	P2543	.528	10X	5.28
~~7814~~	~~P3555~~	~~.101~~	~~10X~~		~~17882~~	~~P2544~~	~~.0253~~	~~10X~~	
17822	P3107	.417	10X	4.17	17882	P2545	1.33	10X	13.3
~~7822~~	~~P3112~~	~~.0139~~	~~10X~~		17882	P2547	1.44	10X	14.4
17828	P2473	.442	10X	4.42	17882	P2549	.924	10X	9.24
17828	P2472	.547	10X	5.47	17882	P2550	.401	10X	4.01
17828	P2522	.417	10X	4.17	17882	P2551	1.03	10X	10.3
7828	P2536	.435	10X	4.35	17882	P2552	.717	10X	7.17
7828	P2548	.525	10X	5.25					
~~7864~~	~~P2491~~	~~.0142~~	~~10X~~						
~~7864~~	~~P2521~~	~~.0156~~	~~10X~~						
~~7864~~	~~P2541~~	~~.160~~	~~10X~~	~~1.60~~					
17864	P2546	.694	10X	6.94					
~~17864~~	~~P2554~~	~~.198~~	~~10X~~	~~1.98~~					
17866	P4850	.550	10X	5.50					

STANDARDS

PREPED ON _____

BY _____

FROM _____ mg/L

STOCK #_____

STANDARD mg/L	VALUE OBTAINED	% of Theoretical

SLOPE	Intercept	Corr. Coef.

ADDITIONAL COMMENTS

Straight Red Line Through Samples Done on Channel 2 no dilution Page 98

Rpt N6053 } straight-
P2685 }

Analyses QA/QC Data Report

QC Batch # N3003 & N3004

Verified: 11/24/86

METHOD BLANK			PRECISION							
			Job # Dup (ETC)							
Spiked Blank (Known)			Original Result							
Spiked Blank Result			Duplicate Result							
% Recovery			R Range							
			ACCURACY							
EXTERNAL REF. QC			Job # Spiked (ETC)							
Known Value			Original Result							
Observed Result			Amount Spiked							
% Recovery			Spiked S' Result							
			% Recovery							

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To Page No. _____

ETC ENVIRONMENTAL TESTING and CERTIFICATION

CONVENTIONAL CHEMISTRY LAB

ANALYZED ON: 11-29-86

TEST: NITRATE, UNITS: mg/l,

METH. REF. #: 353.2, MDL: 0.10, 37

INSTRUMENT #: #1 (Channel 2),

BY: CH

BOOK # CV-12 P. 98

FROM PAGE # ____

LogLink	Job #	ANALYZED CONC.	Dilu	REPORTED CONC.	LogLink	Job #	ANALYZED CONC	Dilu	REPORTED CONC
.7798	P2469	over		*	.17886	P3117	1.15		1.15
.7798	P2477	over		*	17866	P3120	.0207		BMDL
.7798	P2524	over		*	17866	P3122	.0511		BMDL
.7798	P2538	over		*	17866	P3124	.0173		BMDL
7798	P2539	over		*	17866	P3126	.0127		BMDL
7798	P2540	over		*	17882	P2543	over		*
7814	P3555	.487	·	.49	17882	P2544	.0250		BMDL
.7822	P3107	over		*	17882	P2545	over		*
17822	P3112	.007		BMDL	17882	P2547	over		*
17828	P2473	over		*	17882	P2549	over		*
.7828	P2472	over		*	17882	P2550	over		*
17828	P2522	over		*	17882	P2551	over		*
17828	P2536	over		*	17882	P2552	over		*
17828	P2548	over		*					
17864	P2481	.006		BMDL					
17864	P2531	.0245		BMDL					
17864	P2541	1.73		1.73					
17864	P2546	over		*					
17864	P2554	2.06		2.06					
17866	P4850	over		*					
17866	P4851	over		*					
7866	P4852	.398		.40					
7866	P4853	over		*					
17878	P2770	.0462		BMDL					

STANDARDS

PREPED ON ____

BY ____

FROM ____ mg/L

STOCK# ____

STANDARD mg/L	VALUE OBTAINED	% of Theoretical
2.00	1.98	
1.00	1.04	
.50	.497	
.80	.0934	

SLOPE	Intercept	Corr. Coef.

ADDITIONAL COMMENTS

* RPS on CHannel 1

Complete Page 97

Analyses QA/QC Data Report

QC Batch # NC003

Verified: 11/24/86

METHOD BLANK	.003	.0177
Spiked Blank (Known)	.5	.5
Spiked Blank Result	.501	.532
% Recovery	160%	1.06
EXTERNAL REF. QC	EPA	
Known Value	95	
Observed Result	.953	
% Recovery	1.02	

PRECISION

Job # Dup (ETC)	P2473	P4850	P3126
Original Result	over	over	.0217
Duplicate Result	↓	↓	.0194
R Range			

ACCURACY

Job # Spiked (ETC)	P2473	P4850	P3126
Original Result	over	over	.021
Amount Spiked	↓	↓	.5
Spiked S' Result			.506
% Recovery			97%

To Page No. ____

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ETC ENVIRONMENTAL TESTING and CERTIFICATION

CONVENTIONAL CHEMISTRY LAB

TEST: Nitrite, UNITS: mg/l, ANALYZED ON: 11-22-86

METH. REF. #: 353.2, MDL: 0.10, BY: S.T.

INSTRUMENT #: #1 (Channel 2), BOOK # CV-12 P. 100

39 FROM PAGE #: ____

Log/Lab	Job #	Analyzed Conc.	Dilut	Reported Conc.
7524	N6110	0		BMDL
7529	N6120	.0028		BMDL
7529	N6126	.0040		BMDL
7531	P2710	.0024		BMDL
17531	P2725	0		BMDL
7539	P2117	.0043		BMDL
7539	P2116	.0954		BMDL
17539	P2119	.0571		BMDL
17524	P1711	.0043		BMDL
17524	P1713	.0040		BMDL
17524	P1714	0		BMDL
17524	P1717	.00119		BMDL
17562	N6128	0		BMDL
17562	N6148	.00119		BMDL
17573	P2717	0		BMDL
17579	P2726	.118		.12
17584	P3068	.100		.10
17503	P2683	.121		.12
17562	N6122	.00357		BMDL
17524	P1715	.00213		BMDL
17864	P2581	.00119		BMDL
17864	P2541	.0611		BMDL
17864	P2546	.0691		BMDL
17864	P2557	.00281		BMDL

Log/Lab	Job #	Analyzed Conc	Dilu	Reported Conc
17866	P4850	.00151		BMDL
17866	P4851	.0166		BMDL
17866	P4852	.0490		BMDL
17866	P4853	.0446		BMDL
17878	P2776	.00181		BMDL
17866	P3120	.00114		BMDL
17866	P3122	0		BMDL
17866	P3124	.0164		BMDL
17866	P3126	0		BMDL
17882	P2543	.00471		BMDL
17882	P2544	.00213		BMDL
17882	P2545	.00473		BMDL
17882	P2547	.00784		BMDL
17882	P2549	.00119		BMDL
17886	P3117	.0066		BMDL

STANDARDS

PREPD ON ____

BY ____

FROM ____ mg/L

STOCK# ____

STANDARD mg/L	VALUE OBTAINED	% of Theoretical
1.00	.99	99 %
0.50	.51	102 %
0.20	.197	98.5 %
0.05	.046	92 %

SLOPE	Intercept	Corr. Coef.
.0120	-.0005	.9998

ADDITIONAL COMMENTS:

ALL CALculations By X=mY+B.

Analyses QA/QC Data Report

QC Batch # (W3004 NO2)

Verified: 11/24/86

METHOD BLANK	.00337	
Spiked Blank (Known)	.20	
Spiked Blank Result	.198	
% Recovery	99	
EXTERNAL REF. QC	N/A	DS
Known Value		.5
Observed Result		.532
% Recovery		

PRECISION

Job # Dup (ETC)	N6110	P1714				
Original Result	0	0				
Duplicate Result	0	.0015				
R Range	0.0	.0015				
ACCURACY						
Job # Spiked (ETC)		P1714				
Original Result		0				
Amount Spiked		.0262				
Spiked S' Result						
% Recovery		1.31				

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To Page No. ____

ETC ENVIRONMENTAL TESTING and CERTIFICATION

CONVENTIONAL CHEMISTRY LAB

TEST: Phenol, UNITS: mg/L,
METH. REF. # 420.2, MDL: .050,
INSTRUMENT # AA Channel #1,

ANALYZED ON: 11/29/86
BY: L. Herrera / R. Hulet
BOOK # CV-12 P. 115
FROM PAGE # 114

Log Lnk	Job #	Analyzed Conc.	Dilu	Reported Conc.
17539	P2121	0.037	X10	.375
↓	P2123	0.043	STR	BMDL
17543	P4131	"	X10	STR RPT
17584	P3067	0.013	-	BMDL
17639	N9882	"	X5	1:100 RPT
17681	N9884	"	X5	1:100 RPT
	N9880	"	X5	1:100 RPT
↓	P2614	"	X5	STR RPT
17696	P0582	"	-	STR. RPT
17824	P4480	"	X5	1:10 RPT
17828	P2472	"	X5	RPT
17864	P2531	"	X5	RPT
17868	P4512	"	X5	RPT
17866	P4851	0.067	X5	0.335
17867	P2554	0.017	-	BMDL
17866	P4851	0.013	-	BMDL
	P4852	0.017	-	BMDL
↓	P4853	0.022	-	BMDL
17886	P5124	0.128	X10	1.28
17707	N8072	0.048	-	BMDL
↓	N8075	0.027	-	BMDL
17721	N8674	0.131	X10	1.31
17749	P2510	0.031	-	BMDL
↓	P2513	0.096	X10	.964

Log Lnk	Job #	Analyzed Conc	Dilu	Reported Conc
17749	P2514	"		MATRIX RPT STR

STANDARDS

PREPED ON _____
BY _____
FROM _____ mg/L
STOCK # _____

STANDARD mg/L	VALUE OBTAINED	% of True Value
.300		
.200		
.100		
.050		

SLOPE	Intercept	Corr. Coef.

ADDITIONAL COMMENTS

Analyses QA/QC Data Report

SEE CV-12, P 114

QC Batch # PN003

Verified: [signature] 11/29/86

METHOD BLANK			PRECISION							
			Job # Dup (ETC)							
Spiked Blank (Known)			Original Result							
Spiked Blank Result			Duplicate Result							
% Recovery			R Range							
			ACCURACY							
EXTERNAL REF. QC			Job # Spiked (ETC)							
Known Value			Original Result							
X Observed Result			Amount Spiked							
X % Recovery			Spiked S' Result							
			% Recovery							

To Page No. _____

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ETC ENVIRONMENTAL TESTING and CERTIFICATION

CONVENTIONAL CHEMISTRY LAB

TEST: Phenol, UNITS: mg/L,
METH. REF. # AA/EPA 420.2, MDL: .050,
INSTRUMENT # AA Channel #2,

ANALYZED ON: 11/29/86
BY: V. Herman/R. Ward
BOOK # CV-12 P. 113
FROM PAGE # ____

Lg Lnk	Job #	ANALYZED CONC.	Dilu	REPORTED CONC.
17798	P2469	0.030	-	BMDL
	P2477	0.014	-	BMDL
	P2524	0.012	-	BMDL
	P2538	0.012	-	BMDL
	P2539	0.012	-	BMDL
↓	P2540	0.014	-	BMDL
17799	P2393	0.038	-	BMDL
↓	P2394	0.028	-	BMDL
17801	P4467	0.004	-	BMDL
17823	P4224	0.082	-	BMDL
17824	P4480	~	-	RPT
17828	P2472	0.028	-	BMDL
	P2473	0.017	-	BMDL
	P2522	0.017	-	BMDL
	P2536	0.025	-	BMDL
↓	P2548	0.015	-	BMDL
17837	P4709	0.015	-	BMDL
↓	P4714	0.023	-	BMDL
17864	P2481	0.025	-	BMDL
	P2531	0.0106	-	BMDL
	P2541	0.030	-	BMDL
	P2546	0.017	-	BMDL
↓	P2554		-	RPT
17866	P4850	0.321	-	RPT

Lg Lnk	Job #	ANALYZED CONC.	Dilu	REPORTED CONC.
17866	P4851	~	-	RPT
	P4852	~	-	RPT
↓	P4853	~	-	RPT
17868	P4510	0.076	-	.076
	P4511	0.054	-	.054
	P4512	0.056	-	.056
↓	P4513	0.017	-	BMDL
17878	P2776	0.015	-	BMDL
17886	P3120	0.027	-	BMDL
	P3122	0.010	-	BMDL
	P3124	~	-	OFF SCALE RPT
↓	P3126	0.084	-	.084
17882	P2543	0.036	-	BMDL
	P2544	0.060	-	.060
	P2545	0.051	-	.051
	P2547	0.017	-	BMDL
	P2549	0.015	-	BMDL
	P2550	0.021	-	BMDL
	P2551	0.031	-	BMDL
↓	P2552	0.021	-	BMDL

STANDARDS

PREPD ON ____
BY ____
FROM ____ mg/L
STOCK # ____

STANDARD mg/L	VALUE OBTAINED	% of THEORETICAL
[illegible]	PKH	
.350	.85.5	~~85.5%~~
.200	63.5	~~63.5%~~
.100	33.5	~~33.5%~~
.050	18.5	~~18.5%~~

SLOPE	Intercept	Corr. Coef.
270.169	6.3474	0.997

ADDITIONAL COMMENTS

P4480 - matrix interference
P2554 - " "
P4850 - RPT for dilution
P4851 -
P4852 -
P4853 -
P3124 -
ALL CALCS BY X=MY+B.

Analyses QA/QC Data Report

QC Batch # PH004

Verified: 11/29/86 TH Hurst

METHOD BLANK	0.019	
Spiked Blank (Known)	.050	.100
Spiked Blank Result	0.045	0.095
% Recovery	90%	95%
EXTERNAL REF. QC	Not Available	
Known Value		
$\bar{X}$ Observed Result		
T % Recovery		

PRECISION

Job # Dup (ETC)	P2469	P4480	P3120	P2551		
Original Result	0.030	MATRIX	0.028	0.036		
Duplicate Result	0.030		0.026	0.026		
R Range		INTER-	0.002	0.010		
ACCURACY		FERENCE				
Job # Spiked (ETC)	P2469		P3120	P2551		
Original Result	0.030	(CH)	0.027	0.031		
Amount Spiked	0.100		.100	.100		
Spiked S' Result	0.123		0.117	0.130		
% Recovery	91.2		90%	99%		

To Page No. K

ETC ENVIRONMENTAL TESTING and CERTIFICATION

CONVENTIONAL CHEMISTRY LAB

ANALYZED ON: 12-3

TEST: Cyanide, UNITS: mg/l,
METH. REF. #: 335.3, MDL: 0.025,
INSTRUMENT #: #1 (channel 1),

BY: C.M.
BOOK # CV-12 P. 119
FROM PAGE #:

Log Unk	Job #	Analyzed Conc.	Dilu	Reported Conc.	Log Unk	Job #	Analyzed Conc	Dilu	Reported Conc
17837	N4709	0		BmDL	17697	P4748	.005		BmDL
17837	N4714	0		BmDL	17647	P4748	.004		BmDL
17863	P0489	-.007		BmDL	17697	P4748	.004		BmDL
17863	P0493	-.009		BmDL	17698	P1710	.003		BmDL
17863	P0494	.005		BmDL	17701	N4710	.004		BmDL
17863	P0495	-.002		BmDL	17701	N4715	.004		BmDL
17866	P4850	.539		.539	17866	P4851	over		RDO
17868	P4510	*		Redo	17866	P4852	over		RDO
17878	P2776	.007		BmDL	17866	P4853	*		Redo
17881	P1865	.002		BmDL	17868	P4510	*		Redo
17883	N4708	.002		BmDL	17868	P4511	*		Redo
17883	N4711	.003		BmDL	17868	P4512	*		Redo
17833	P4241	.0197		BmDL	17868	P4513	*		Redo
17933	P4242	.0169		BmDL	17883	N4712	*		Redo
17833	P4243	.0211		BmDL	17883	N4713	*		Redo
17833	P4244	.0186		BmDL	17889	P2759	*		Redo
17834	P4248	.0185		BmDL	17889	P2761	*		Redo
17834	P4249	.0189		BmDL	17889	P2774	*		Redo
17834	P4250	.0231		BmDL	17889	P2775	*		Redo
17834	P4251	.0189		BmDL	17833	P4235	*		Redo
—	P2774	.006		BmDL	17833	P4236	*		Redo
17693	P2916	.0185		BmDL	17833	P4237	*		Redo
17693	P2917	.0312		BmDL	17833	P4238	*		Redo
17697	P4748	.006		BmDL	17833	P4239	*		Redo

STANDARDS

PREPED ON 12-2
BY D.B.
FROM mg/L
STOCK #

STANDARD mg/L	VALUE OBTAINED	% of Theoretical
.500	.493	98.6%
.400	.405	101.%
.200	.205	102.5%
.100	.102	102%

SLOPE	Intercept	Corr. Coef.

ADDITIONAL COMMENTS

* RPT DUE TO INSTRUMENTATION PROBLEM
P4851 10x
P4852 20x

Analyses QA/QC Data Report

QC Batch # CY003

Verified: 12/3/86

METHOD BLANK	.008
Spiked Blank (Known)	.100
Spiked Blank Result	.103
% Recovery	103%
EXTERNAL REF. QC	EPA
Known Value	.224
Observed Result	.228
% Recovery	101.7%

PRECISION		
Job # Dup (ETC)	N4709	P4748
Original Result	0	0.006
Duplicate Result	0	0.005
R Range	0.0	0.001
ACCURACY		
Job # Spiked (ETC)	N4709	
Original Result	0.0	
Amount Spiked	.200	
Spiked S' Result	.201	
% Recovery	99%	

To Page No.

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ETC ENVIRONMENTAL TESTING and CERTIFICATION

CONVENTIONAL CHEMISTRY LAB

TEST: Cyanide, UNITS: mg/l, ANALYZED ON: 12-13-86
METH. REF. #: 335.3, MDL: 0.025, BY: C.B. / J.C.
INSTRUMENT #: FI (Channel 1), BOOK # CV-12 P. 150
FROM PAGE #: ____

Log Link	Job #	Analyzed Conc.	Dilu	Reported Conc.
17866	P4853	.123	10x	1.23
18065	P4032	.228	100	22.8
1820·	86632	.0462		.046
18203	P6634	.0246		.025
18203	86641	.0252		.025
182 7	86665	.0183		BwDL
182 7	86666	.0270		.027
18207	86667	.00568		BwDL
182 7	8 668	.00741		BwDL
18208	85794	.0667		.067
182 8	85796	.00509		BwDL
182 ·	P3809	.225	100	22.5
182 :	P3813	Interfere		Redo
18214	P6646	.006		BwDL
18243	86555	.00626		BwDL
1824 ·	86556	.00625		BwDL
182 ·	86557	.00623		BwDL
18245	86558	.006		BwDL
18245	86559	.008		BwDL
18245	86560	.006		BwDL
18248	85792	.00972		BwDL
18253	87918	.006		BwDL
18264	85795	.006		BwDL
18264	86725	.0201		BwDL

Log Link	Job #	Analyzed Conc	Dilu	Reported Conc
17874	P4831	.006		BwDL
18236	P3873	.006		BwDL
18236	P3874	.006		BwDL
18236	P3881	.00458		BwDL
18236	P3882	.00777		BwDL
18236	P3883	.0059		BwDL
18236	P3884	.00589		BwDL
18236	P3885	.00587		BwDL
18236	P3886	.00586		BwDL
18236	P3889	.00584		BwDL
18236	P3890	.00583		BwDL
18234	P3867	.00581		BwDL
18234	P3868	.0058		BwDL
18234	P3877	.009		BwDL
18234	P3878	.00574		BwDL
18234	P3879	.00572		BwDL
18234	P3880	.00571		BwDL
18234	P3893	.00569		BwDL
18234	P3894	.00568		BwDL
18234	P3895	.00566		BwDL
18234	P3896	.0113		BwDL
18269	P3872	.007		BwDL
18269	P3887	.00694		BwDL
18269	P3888	.0105		BwDL

STANDARDS

PREPED ON ____
BY ____
FROM ____ mg/l
STOCK# ____

STANDARD mg/L	VALUE OBTAINED	% of True Value
.500	.491	98.2%
.400	.406	101.5%
.200	.210	105%
.100	.0985	98.5%

SLOPE	Intercept	Corr.

ADDITIONAL COMMENTS

P3813 ROT Straight

Analyses QA/QC Data Report

QC Batch # Cy007

Verified: 12/16/86

PRECISION

Job # Dup (ETC)	86667	P3881	P6558	P3888	P3887	P3881
Original Result	.00568	.009	.002	.0105	.106	.115
Duplicate Result	.00774	.006	.008	.007	.109	.118
R Range	.002	.003	.003	.009	.003	.003

METHOD BLANK	-.009
Spiked Blank (Known)	.10
Spiked Blank Result	098
% Recovery	98%
EXTERNAL REF. QC	EPA
Known Value	.224
X Observed Result	.212
X % Recovery	94.6%

ACCURACY

Job # Spiked (ETC)	P6667	P3881	P6558	P3888	P3881	
Original Result	.0067	.008	.003	.009	.108	.117
Amount Spiked	.2	.2	.2	.2	.2	.2
Spiked $ Result	.224	.197	.215	.185	.304	.311
% Recovery	108.6%	98.5%	107.5%	92.5%	98%	97%

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To Page No

ETC ENVIRONMENTAL TESTING and CERTIFICATION

CONVENTIONAL CHEMISTRY LAB

TEST: CYANIDE, UNITS: mg/L, ANALYZED ON: 12/8/86

METH. REF. # EPA 335.3, MDL: 0.025 mg/L, BY: MC/ST

INSTRUMENT # #1 Chml #1, BOOK # CY-12 P. 136

FROM PAGE # X

Log Link	Job #	Analyzed Conc.	Dilu	Reported Conc.
17823	~~P4274~~ P4274	~~0.006~~ 0.006	-	BMDL
17866	P4252	0.043	1:25	1.08
	P4853	OFF SCALE	-	~~BMDL~~ 1:10
	P4851	0.0287	-	0.029
17868	P4510	0.0024	-	BMDL
	P4511	0.005	-	BMDL
	P4512	0.0718	-	0.072
	P4513	0.0081	-	BMDL
17883	N4712	0.0075	-	BMDL
	N4713	0.0079	-	BMDL
17889	P2759	0.0119	-	BMDL
	P2761	0.0086	-	BMDL
	P2774	0.006	-	BMDL
	P2775	0.0093	-	BMDL
17833	P4235	0.005	-	BMDL
	P4236	0.007	-	BMDL
	P4237	0.008	-	BMDL
	P4238	0.009	-	BMDL
	P4239	0.006	-	BMDL
	P4240	0.009	-	BMDL
18065	P4030	0.154	1:100	15.4
18068	N8922	0.006	-	BMDL
18078	P5373	0.009	-	BMDL
18084	P2987	0.0069	-	BMDL
18084	P4189	0.0102	-	BMDL
	P4190	0.009	-	BMDL
	P4205	0.0098	-	BMDL
	P4219	0.0104	-	BMDL
	P4220	0.0104	-	BMDL
	P4223	0.0105	-	BMDL
	P4224	-0.0102	-	BMDL
	P5017	0.0139	-	BMDL
18124	P2983	0.0070	-	BMDL
18128	P5813	0.0087	-	BMDL
	P5814	0.0091	-	BMDL
18132	P2779	0.0088	-	BMDL
	P2780	0.0064	-	BMDL
	P2781	0.0101	-	BMDL
18155	P5372	0.0108	-	BMDL
	P5374	0.0116	-	BMDL
	P5375	0.0108	-	BMDL
	P5376	0.0124	-	BMDL
	P5377	0.0141	-	BMDL
18195	P7549	0.0124	-	BMDL
	P7550	0.0127	-	BMDL
	P7551	0.0127	-	BMDL
	P7552	0.0126	-	BMDL
	P7553	0.0114	-	BMDL

STANDARDS

PREPED ON _____

BY _____

FROM _____ mg/L

STOCK # _____

STANDARD mg/L	VALUE OBTAINED	% of THEORETICAL
0.500	0.504	100.8
0.400	0.397	99.2
0.200	0.198	99
0.100	0.0952	95.2

SLOPE	Intercept	Corr. Coef.

ADDITIONAL COMMENTS

Analyses QA/QC Data Report

QC Batch # CY006

Verified: 12/9/86

METHOD BLANK	ND
Spiked Blank (Known)	0.200
Spiked Blank Result	0.182
% Recovery	91.0
EXTERNAL REF. QC	EPA
Known Value	0.224
$\bar{X}$ Observed Result	0.195
$\bar{Y}$ % Recovery	87.0

PRECISION

Job # Dup (ETC)	P4274	N8922	P5017	P5376	P7557
Original Result	ND	0.007	ND	ND	ND
Duplicate Result	ND	0.017	ND	ND	ND
R Range	0	0.010	0	0	0

ACCURACY

Job # Spiked (ETC)	P4274	N8922	P5017	P5376	P7557
Original Result	0	0.010	0	0	0
Amount Spiked	0.20	0.100	0.200	0.200	0.300
Spiked S' Result	0.182	0.121	0.264	0.26	0.293
% Recovery	91	111.0	132.0	130.2	97.7

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ETC ENVIRONMENTAL TESTING and CERTIFICATION

LOG LINK 17866

LABORATORY CHRONICLE: Metals Department

Samples P4850 - P4853

	Chemist	Date
Hg Prep	—	—
AA Prep	—	—
ICAP Prep	[illegible]	11/24/86

Lab Supervisor Joan Komarek Date 11/28/86

ETC FORM #101

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